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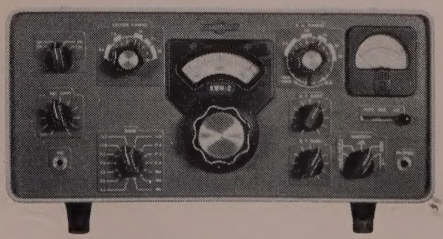

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Vol. 19, No. 3 March 1963

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For further information, check number 6, on page 110

ZERO BIAS

THE American Radio Relay League has made, after a lapse of some ten years, an unprecedented appeal to its membership, asking if e amateur radio licensing structure, as we now ıow it, needs alteration. We congratulate them ı this seemingly progressive move, since they have ɔt been particularly noted for their progressive ctions in the past.

Their newest move, however, seems to have overepped the bounds of reality.

It pleases us, nevertheless, to see that they feel centive still plays an important part in our hobby. ıat their proposal, designed to reinject stimulus to amateur radio, is honorable is undeniable. The ct remains that they have looked for, and found simple solution to a complex problem.

It is rather obvious that not very much imagina-ɔn was used in advocating a system, considered outdated by the FCC ten years ago.

In requesting a return to Class-A type phone ivileges, the League admits, *ex post facto,* that ense changes made in 1952 were made in error. they were made in error, why then has the League lerated them for over a decade? And now, why, ter they recognize the fault, do they suggest to ght this wrong with another wrong?

The premise that special phone frequencies would nd incentive to amateurs is basically sound; it ɔrked in 1932, but this is 1963 and things have anged. To "require" amateurs to leave the air ring an interim period while licenses are upgraded rather absurd.

Three basic problems have to be solved before vocating restricted phone-band incentives. Let's ke them one at a time.

1—*Improve Operating Practices:*

Are we naive enough to think that an increased eoretical examination would solve the problem poor operating procedures?

Whether one is a beginner down the street or e old-timer across town, operating savvy is proɔrtional only to personal pride, not *E=IR!* As d as it may seem, and we must face facts, a is a lid and no amount of Ohm's Law is going change him.

2—*Improve Technical Proficiency:*

The improvement of technical proficiency by e introduction of restricted phone bands, or r that matter any artificial restriction, is rather ɔgical. We cannot force amateurs to educate emselves by segregating bands, or by any method. e can, however, through proper stimulus, enurage their progress, for only through authentic mpensation can we expect authentic performance.

3—*Reduce Phone-Band QRM:*

Here, we admit, the League has solved one probn; few, or no phone licenses—very little phone operation! A simple answer—but as we said before, simple answers are for simple problems.

We offer a more complex solution: the establishment of restricted phone bands *other* than those phone bands now in existence. Yes—you read it right—take away some c.w. frequencies and give them to the Amateur Extra licensee for phone!

This is, of course, a daring move. Let's review the possible results.

By opening additional phone frequencies on *all* amateur bands, strictly for the Amateur Extra we are immediately alleviating a tremendous load on phone frequencies now in use. Not only will the General and Conditional licensee obtain more breathing space, but the Amateur Extra will also find clear and fertile pastures in which to operate.

The incentive derived herein is, in our opinion, definitely not artificial and we can expect that the stimulus provided will spur amateurs in the right direction.

What the bandwidth will be and where the bands should go is the "complex" part of this solution.

Some will argue and understandably so because this is by no means a Utopian solution; but it is a stab in the right direction, and accomplished with absolutely no changes to our present licensing system.

Webster defines **in•cen•tive** as: influencing to action; encouraging; stimulating; motivating. We think our proposal (not new by any means) features all of these—plus perhaps a few more.

FLASH

It is our understanding that the 160 meter segment 1875-1925 kc may soon be reallocated for amateur operation. It is also our understanding that in some areas, power limitations will be reduced while in others there will be an increase. There is also a possibility that areas now presently denied 160 privileges will be granted operation at considerably reduced power.

OUR COVER

That sleek little box houses a 6146 and some Command Set components that make for a mighty fine c.w. rig. The author calls it the "Hetrociter" and it comes complete with vacuum tube and timed sequence keying.

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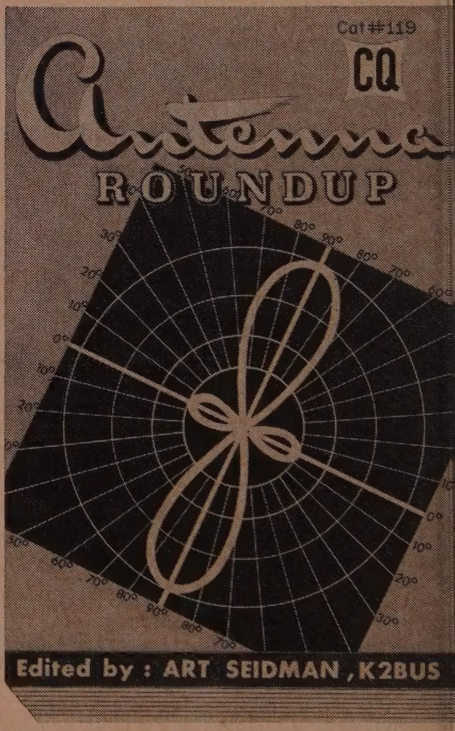

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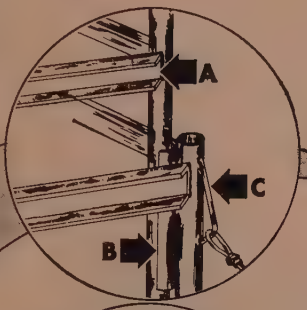

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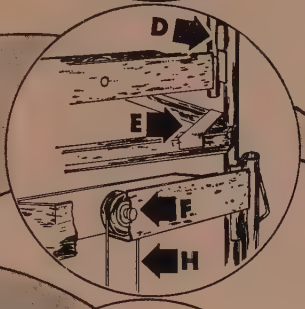
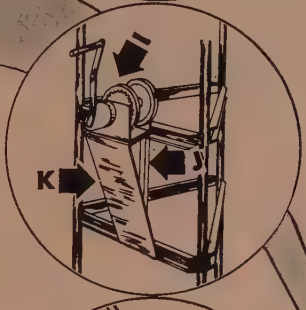


- Geared Crank-up Winch and Safety Lock.
- Extra Reinforcing Spreader.
- Heavy Steel Winch Frame.



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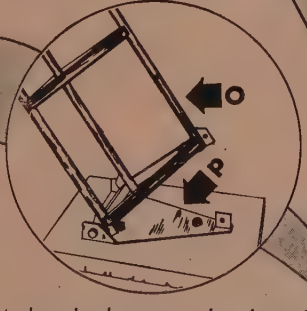

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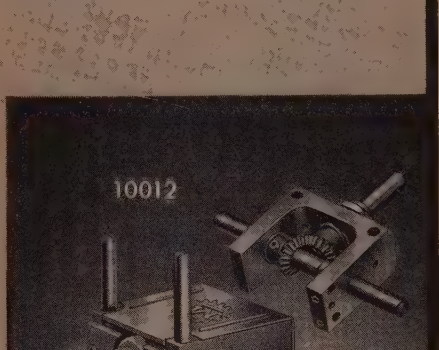

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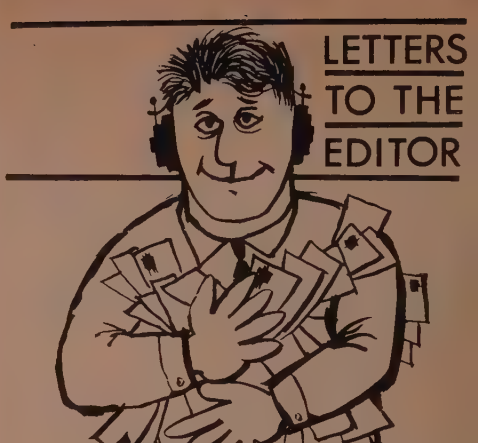

Toe The Boot-leggers

Editor, *CQ:*

I believe I've never been more disappointed in the reasoning powers of some elements in this land of ours as I was upon reading of the Anti-Communist Amateur Radio Network in January's ZERO BIAS.

I believe that if the ACARN members were to examine the present state of affairs in this country, in regards to radio, they would uncover some interesting, if not startling, facts: 1) At present, gentlemen, there is precious little preventing "subversives" (and I use the term loosely) from setting up shop in the amateur radio bands; 2) This is possible simply because the Federal Communications Commission, great bunch of guys that they are, are too understaffed with field personnel to even adequately police the broadcasting industry, much less scratch the surface with amateurs, CB'ers and the like; 3) Modern coding techniques allow almost anyone to conceal in an ordinary ragchew just about anything they desire.

I'd like to cite an example of the almost unlimited opportunity we already provide. I've been completely inactive as an amateur for the past several years while attending college. I returned to 75 phone not long ago to find a whopping big signal from 'Northeastern Pennsylvania' signing my call, W3JXA, with phonetics. I put out a judicious CQ and he answered with W3JSA. S'funny, because Bob, W3JSA, happens to live three miles from me here near Philadelphia, and the similarity of calls has caused no end of consternation amongst the locals! I pointed this little fact out to this guy and, for some reason, he never came back. That's why I say there is precious little preventing Aunt Minnie or Uncle Joe or anyone else for that matter from setting up shop on the amateur bands.

So, gentlemen, though I still lack several months of legal voting age, my letters to my Senators are leaving with this letter and they ask that reciprocal licensing be included in the Communications Act. May we have, as Senator Goldwater pointed out, more good will and better foreign relations.

Richard E. Reeves, W3JXA
P. O. Box 22
Gwynedd Valley, Pa.

Low Angle

Editor, *CQ:*

I have read the interesting article regarding antenna design in the November, 1962 *CQ* and wish to offer several comments. Figure 4 shows the vertical pattern for several vertical antenna heights, and it appears that there is no radiation along the ground at 0°. In the

◀ For further information, check number 10, on page 11

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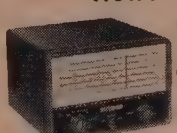

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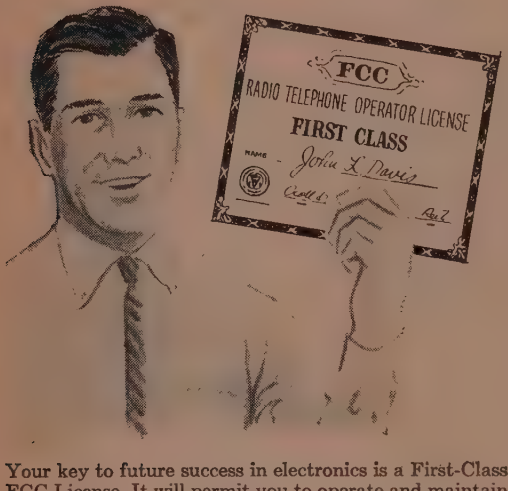

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standard broadcast band the vertical antenna is utilized and is required by the FCC, for heights up to 5/8 wave lengths because it has maximum radiation along th ground. For antenna heights between 1/8 and 5/8 wave lengths the horizontal radiation is always stronger tha any vertical radiation. This condition for various ar tenna heights is shown on Figure 5 of the FCC's Rul 3.190 for broadcast stations. It is also shown on Pag 887 of Termans *Electronic and Radio Engineering* Fourt Edition. This condition of maximum radiation along th ground means that the Vertical does even a better jo than claimed!

Regarding the angle of departure of a signal for DX stations, over the years I have given this a great deal o thought and was glad to get W3JHR's thinking on thi situation and recommendation for low angle radiation I think that for general amateur communications th antenna with a broad vertical exposure is best, as thi will provide coverage at all possible vertical angles fo contacts with stations at any distance. Of course broa exposure is also good because it will provide a signa for any number of hops that might prevail at the tim of operation. Of course, the vertical antenna meets thes requirements and with our low sun spots and greate utilization of the lower frequencies, I believe the articl is very timely.

J. B. Hatfield, W7AG
906 36th Ave.
Seattle 22, Wash.

Civil Defense

Editor, *CQ:*

I think Civil Defense has overlooked a good bet. I the event of an emergency, broadcast stations are t cease broadcasting on their customary frequencies an begin broadcasting on either 640 or 1240 kc.

Why doesn't CD clear the way so that in the even of emergency, authorized amateurs could make use o the rest of the broadcast band with a power limit o perhaps 5 or 10 watts? If this plan were adopted, ther would be enough toy broadcasters, wireless baby sitter *etc.* scattered throughout the country to furnish ther equipment to work with, without the necessity of buy ing or building additional equipment.

Such communications could fill a serious gap in th event of dire emergency and would likely give far mor dependable communications than the high frequencies

C. D. Prewitt
129 N. Maysville S
Mt. Sterling, Ky.

The Military Speaks

Editor, *CQ:*

Read K6BX's very timely letter about phone patc abuses in the October issue of CQ and wish to exten my sincere agreement.

I am in the Navy and, thus, a military operator an guilty of the very things mentioned but I began t realize about two years ago that our manner of han dling phone patches was not quite proper.

In my estimation, the military operators use som of the worst possible procedure and seem to have onl one thing in mind, namely "Phone Patches." I ge very tired of hearing these "military" stations break ing in with "Break, Break," and then requesting phone patch. Many of these stations are NOT hams i tbe true sense of the word but, rather, commercial op erators and they are guilty of what I would call ver poor procedure. As mentioned, these stations can be come very indignant if someone should happen to tun up on their frequency and call CQ! God be mercifu to the individual who is unfortunate enough to get o one of the "clear channels." I have some very goo friends that are engaged in the "business" of runnin phone patches but feel they are guilty of the thing I have just mentioned. Most of the countries in th world do NOT permit phone patching within the respective countries. I feel, too, that "patching" shoul be of some concern to the commercial telephone an wireless companies but am surprised that I have hear very little in the way of complaints from this area.

I still make patches from time to time but am ver careful about making the arrangements and am certai to find out from the other operator about his willingnes

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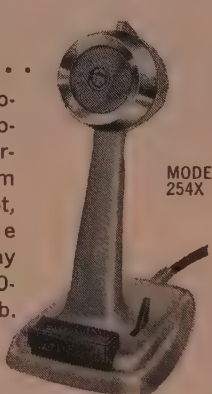

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to handle them. I feel, however, that I would be perfectly willing and content to abide with an FCC decision to terminate phone patching. The practice is definitely being abused and the predominant abuse is in using the facilities for the conducting of business transactions.

Ron Burns, KL7YK/KG6
Guam, M.I.

Editor, *CQ:*

After reading LETTERS, (K6BX, Oct. & W9YMZ, Sept.) I couldn't help taking time to write, offering my own view and my full concurrence with Clif on the subject of patching.

Being a Navy Radioman, stationed aboard ship in the Far East, I am able to get a first hand view of the subject of abusive use of patching by the Military.

At this end of the world it is easy to see that the Military is by far the worst offender. Any morning from 2000 GMT until about 0400 GMT you can hear KR6s, KG6s, KW6s and the rest of the military stations from the western and southern Pacific running patches. This in itself wouldn't be so bad if it was conducted as described by W9YMZ, however, this is not how it is being done. "A few patches" as described by W9YMZ, in reality, is a few thousand patches being conducted from this end of the world each day.

I am unable to recall any instances of hearing business transactions being conducted, but there are many of these patches that are so trivial and needless that it is almost ridiculous. One that comes to mind, off-hand is the case of a Naval Officer, fresh out of college running a patch to the campus back home just to say "Hello" to the boys. This is not just an isolated case I have heard many patches just as trivial if not more so.

It has grown to the point where, between the hours of 2000 GMT and about 0400 GMT, it is almost impossible to find an opening on 15 or 20 meters because of the "clear channel" boys running patches. I feel that patching is going too far when it is depriving other amateurs of the use of their hobby for what it was originally intended.

As Clif pointed out in his letter, us Military folk have our own MARS facilities and frequencies for this purpose and should be using them instead of taking up frequency space that was intended for other purposes.

"A Well Done" to Clif on his letter and also, "A Well Done" to all hands at *CQ* for turning out a first rate magazine.

J. D. Rose, RM2, WAØDLG
USS *Washoe County*
c/o FPO, San Francisco, Calif.

Phantoms, Too!

Editor, *CQ:*

With regard to Mr. Fred Dodson's comment on phone patches in your January LETTERS column, I would be interested to know if he has discovered in the occult sciences a scheme for communicating with departed relatives via the phone patch. If he will reveal how ". . . Mrs. B. to speak to her long departed son . . ." is accomplished, I'm sure amateur radio will add many interested people to its ranks.

John L. DuBois, K9YHC
2108 W. Birchwood Ave.
Chicago 45, Illinois

Some Answers

Editor, *CQ:*

I have read with a great deal of interest LETTERS (February, 1963) which deal primarily with the controversy over the various classes of licenses in use on the ham bands.

I believe Bob Forman, W9RJH really caught the ball with this quote, "After all, whether an operator is a gentleman or a slob is not a matter of license qualifications."

OM Goeller finds 50 mc vacant above 51.5 mc and can't understand why this part of the band is not occupied. There is a good reason. TVI is virtually non-controllable in this region due to the broad selectivity characteristics of the TV receivers. This is why most 6 meter operation is actually below 50.5. However, there is more activity on 6 meters in this area than on 28 m

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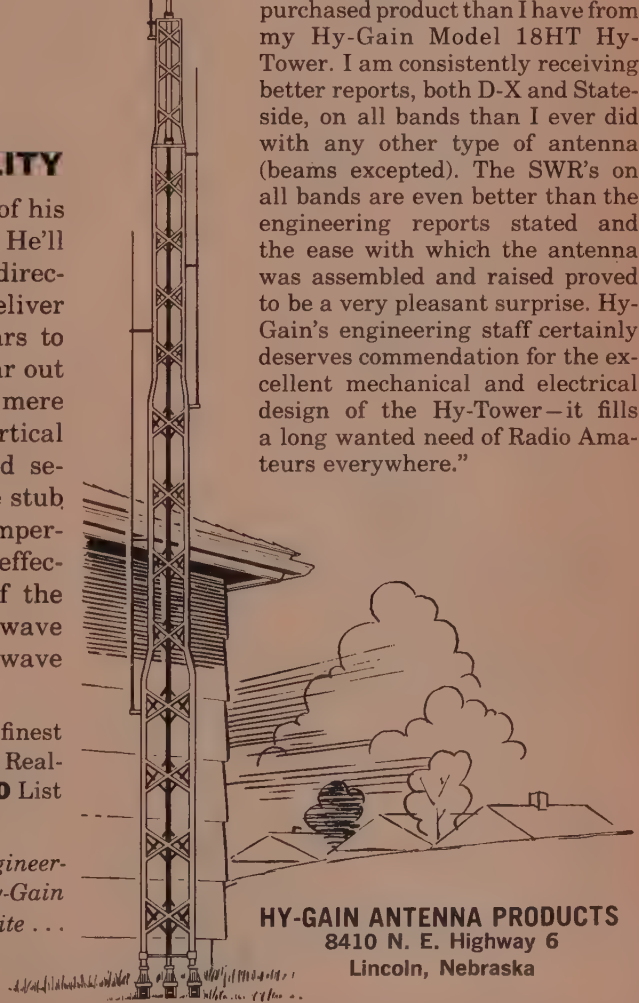

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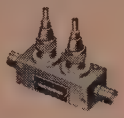

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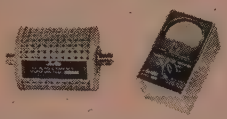

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which means that at least activity breeds activity. There are about as many Generals as Techs on 50 mc in this area and they all seem to get along.

I agree with some of the other letter writers that it would be most interesting to try the 5 w.p.m. code test on the so-called big shots on 75 and 40 . . . they may have used c.w. years ago for a month or so, but by just listening, they admit to having forgotten the code almost completely. How can they conscientiously renew their licenses year after year with that as an admitted fact?

No, I don't believe there is a very great difference in the classes of the amateur licensees. I'm sure the jealousies expressed over this latest proposal are just that . . . fear that perhaps someone else might be permitted the use of frequencies that now are fond memories but permissible to the General. I'm sure the Novices and Technicians have ham radio more at heart than the part-line operators on 75.

Nice to have a place to blow off a bit of steam . . . keep this line open to all . . . Novice, Tech, and *all* classes of Generals!

Del Brown, K9CZI
2619 Lakeshore Drive
Sheboygan, Wisconsin

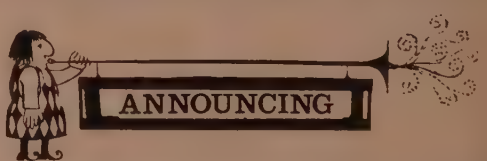
Scant Space For Slow Scan

Editor, *CQ:*

Since so many of the people associated with ham radio still seem to be mourning the loss of the eleven meter band and concerning themselves with the non-amateur service now using that band, it would seem that there would be little difficulty in getting a petition started that would give us the same privileges in the 29.5-29.7 mc range that we formerly had on the eleven meter band.

This would be a boon to those interested in slow-scan TV, tone RTTY and some of the others. It should also boost the use of the ten meter band since this area seems to be little used at the present time except for a very few local nets and RACES nets, even most of these are below 29,500 kc. Let's get something going on this. A couple of hundred kilocycles here would fill the bill for the slow-scan boys for sure. How about it?

Hal Davis, W8MTI
4761 Baldwin St.
Onondaga, Michigan



Broome County, N. Y.

The Southern Tier Radio Clubs of Broome County, N.Y. will hold their annual dinner on March 30th, at the St. John's Ukrainian Hall, Virginia Ave., Johnson City, New York. This event promises to be the largest in that area and reservations at $3.50 must be made before March 25th. WA2RTN, 16 Duke St., Binghamton, N.Y. is in charge.

Wheel-N-Whips

Sunday, March 31st will mark the first Southern California Mobilfest and field strength trials to be held in North Hollywood Park, Magnolia Blvd. and Tujunga Ave., in North Hollywood, Calif. Activities are planned for rigs operating 75 and 2 meters. The club has secured thet use of industrial test equipment to select the best operating installation. The Wheel-N-Whips Mobile Radio Club is located in Van Nyus, California and their P.O. Box number is 3252.

Radex

George Kinnear, 130-13th St., Brandon, Manitoba claims he is the only one who has every issue of *Radex Magazine* (May, 1933 to October, 1941). Anyone say different?

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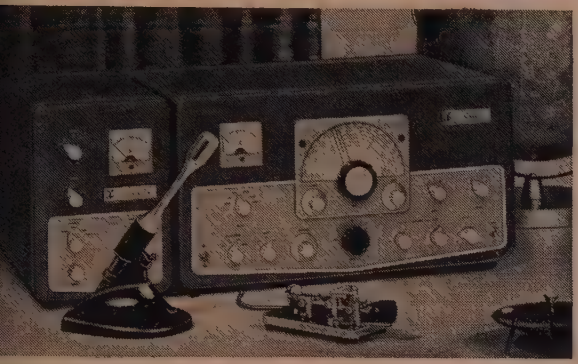

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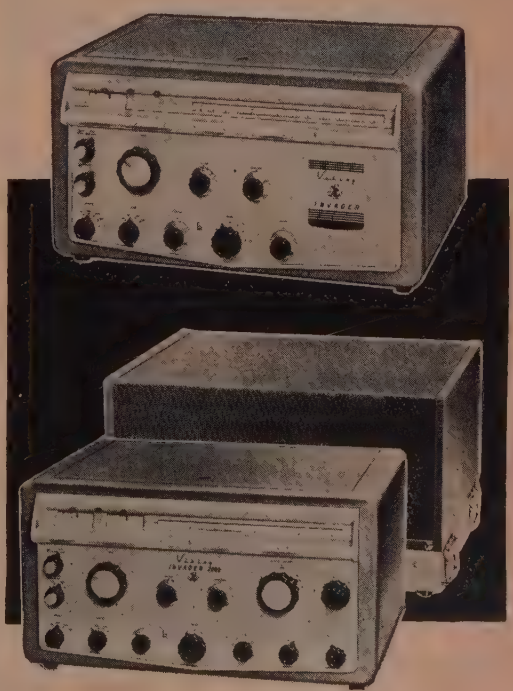

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RTTY Dinner

The White Turkey House, 260 Madison Ave., N.Y. (near 38th Street) is the gathering place for RTT enthusiasts from all parts of the country. The Annu RTTY Dinner will be held on Monday evening, Mar 25, beginning at 7 P.M. Banquet accommodations a limited, and quite a few people had to be turn away last year. Make your reservations early. Check money order for $6.00 should go to Elston Swansc W2PEE, c/o Instruments For Industry, Inc., 101 N South Road, Hicksville, N.Y. A few outstandi amateurs are expected to speak including Merril Swa W6AEE and Phil Catona, W2JAV. It is also expect that a staff member from Trak Electronics will spe and demonstrate their c.w. to RTTY encoder. The 25 is the first day of the IRE Show and a large turn out expected.

Twelfth S.S.B. Dinner

The Single Sideband Amateur Radio Association w sponsor its 12th annual dinner and Hamfest on Tuesda March 26th, at the Hotel Statler-Hilton, 33rd St. a 7th Ave., N.Y.C. Equipment displays open at 10 A. and the steak dinner starts at 7:30 P.M. Broadway a TV personalities will be on hand to entertain yo Tickets in advance are $12.50 and $13.50 at the do Send checks for reservations to SSBARA, care of B Robins, W2JKN, 4665 Iselin Ave., New York 71, N.

Stolen

Charles Duncan, K9YLG reports that his Hea Cheyenne and Comanche were stolen from his mob installation around January 17. Both units were mount in a frame which may have been discarded. The un are identifyable in that the receiver has "K9YL lightly etched in the lower right hand corner and t transmitter has an enlarged hole in the lower left-ha corner which is used in conjunction with a black kn which runs through to the chassis. A reward of $25 is offered for information leading to its recovery. C Duncan's address is 2854 North Marmora, Chicago Ill. Phone BERKSHIRE 7-4059.

Kansas QSO Party

The Emporia Amateur Radio Club, Inc. will spon its 1963 Kansas QSO Party beginning at 0601 GM March 16 and ending 0601 GMT, Monday, March 18 Participants should give call, county and state. No ser numbers will be used. Plaques will be issued to w ners in and out of state. Logs go to R. J. McGli 929 Garfield, Emporia, Kansas and should be po marked no later than April 1, 1963.

Corrections

Figure 12 of "The Mark III DX Antenna," C December 1962, p. 46, should include a lead from 80 to the 40 meter position on the center switch secti

A 2.5 mh r.f. choke is missing in the plate circ of the 6L6 in "The 'Super-Pi' Transmitter," *CQ*, J uary 1963, p. 21. In the same issue, on page 33, specifications are omitted. The coil is identical to Sorry.

Attention Subscribers

Beginning last month you probably notice that your copy of *CQ* was "flat-mailed"; tha is, mailed without the usual brown pape wrapper.

Most readers are aware that increase postal rates went into effect earlier this yea In order to keep subscription rates below th 40¢ per copy now paid by subscribers, we fin it necessary to reduce costs in this manne

Canadian and DX copies of *CQ* will co tinue to be mailed with the outer wrapper required by postal regulations.

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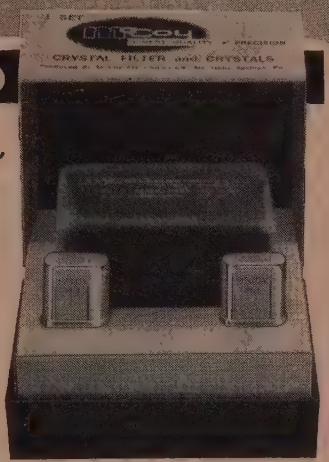
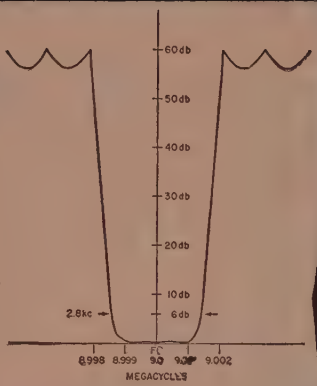
McCoy SINGLE SIDE BAND FILTERS

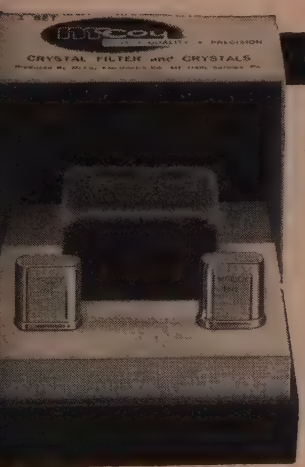
The GOLDEN GUARDIAN (48B1)

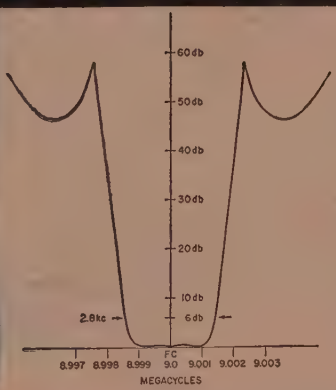


TECHNICAL DATA
Impedance: 640 Ohms in and out (unbalanced to ground)
Unwanted Side Band Rejection: Greater than 55db
Passband Ripple: ± .5db
Shape factor: 6 to 20db 1.15 to 1
Shape factor: 6 to 50db 1.44 to 1
Package Size: 2 7/16" x 1 19/32" x 1"
Price: $42.95 Each



The SILVER SENTINEL (32B1)





TECHNICAL DATA
Impedance: 560 Ohms in and out
Unwanted Side Band Rejection: Greater than 40db
Passband Ripple: ± .5db
Shape factor: 6 to 20db 1.21 to 1
Shape factor: 6 to 50db 1.56 to 1
Package Size: 1¾" x 1¼" x 1"
Price: $32.95 Each

Both the Golden Guardian and the Silver Sentinel contain a precision McCoy filter and two of the famous M-1 McCoy Oscillator crystals. By switching crystals either upper or lower side band operation may be selected. Balanced modulator circuit will be supplied upon request.

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Dept. Q-8
MT. HOLLY SPRINGS, PA.
Phone: HUnter 6-3411

SUBSIDIARY OF OAK MANUFACTURING CO

For further information, check number 19, on page 110

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KAI BERGSTRÖM
VEGAGATAN 2 – LUND – SWEDEN

SM7SY
SM7SY
SM7SY
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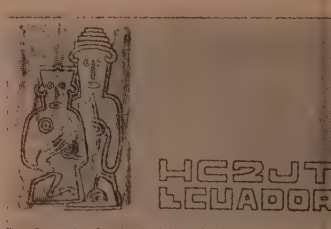
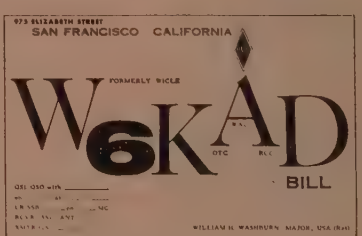
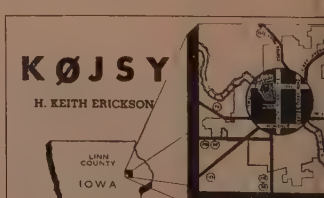
SM7SY
SM7SY
▶ SM7SY
SM7SY
SM7SY
SM7SY

WHEW! So you think judging the Q Contest is easy, eh? Well, this mo we were literally swamped with be tiful cards, each a potential winner. The cre of the crops appears below; the others will held over till next month. Heading the list SM7SY with a strikingly simple card in bl with a red arrow. A one year sub to Kai for efforts. The runners-up (which in other mon might well have been winners) are HC2 W6KAD and KØJSY.

Runners Up







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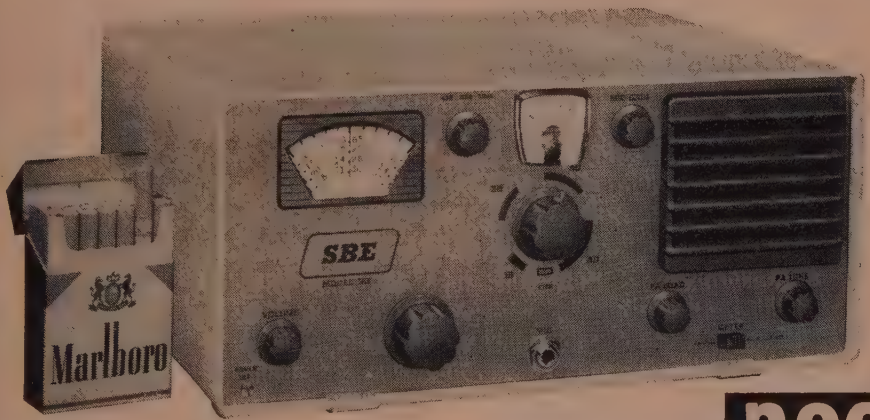

Bands: 80-40-20-15 meters.

Power input: 135 watts P.E.P. maximum (speech waveform).

Receiver sensitivity: Better than 1 uV for 10 db signal/noise ratio.

Sideband selection: Upper or lower sideband selectable by panel switch without change in frequency.

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2—PL-500 beam power tetrodes.
1—12DQ7 driver. 19 transistors.
13 diodes, 1 zener diode.

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Size: 5½"H, 11¾"W, 10¼"D. 15 lbs.

389.50

SB-33 Special inverter, 12V DC/115V AC 59.50
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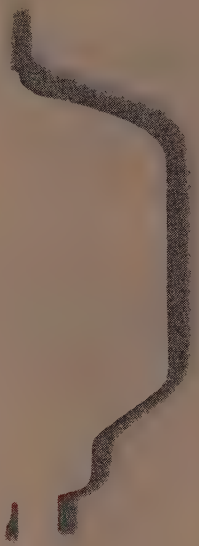
SSB TUBES DON'T JUST HAPPEN



From its radiation-cooled graphite anode and all-glass envelope, to its unique internal structure, the new Amperex 8179 Tetrode was designed from concept through accomplishment to be a better SSB linear amplifier than any other tube ever before available in its power class.

THEY

How well Amperex has achieved its objective is expressed in the significant facts that the 8179 will provide **more power, with lower intermodulation distortion, at higher operational efficiency** than ever before attainable in SSB linear service—and we mean **linear!**

The highly efficient heat radiation properties of the 8179 eliminates the need for costly, space-consuming cooling fans, blowers and related accessories. The tube incorporates a thoriated tungsten filament with high reserve emission rated at 7.5 volts and 22.6 amperes.

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Class AB1 Grounded Cathode Linear RF Amplifier
Single Sideband Suppressed Carrier Operation

Typical Operation at 2 Kw PEP Input

DC Plate Voltage	4000 volts
DC Grid No. 2 Voltage	600 volts
Zero Signal DC Plate Current	150 Ma
Max. Signal DC Plate Current	515 Ma
Max. Signal DC Grid No. 2 Current	115 Ma
Tube Efficiency at Peak of Envelope	68%
Average DC Plate Current (two tone test)	360 Ma
Average DC Grid No. 2 Current (two tone test)	60 Ma
Peak Envelope Plate Power Output	1410 Watts
3rd Order Intermodulation Distortion	34 db
5th Order Intermodulation Distortion	38 db

For complete data on this and other transmitting tubes, write: Amperex Electronic Corporation, Communication and Industrial Tube Department, Hicksville, Long Island, New York.

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For further information, check number 23, on page 110

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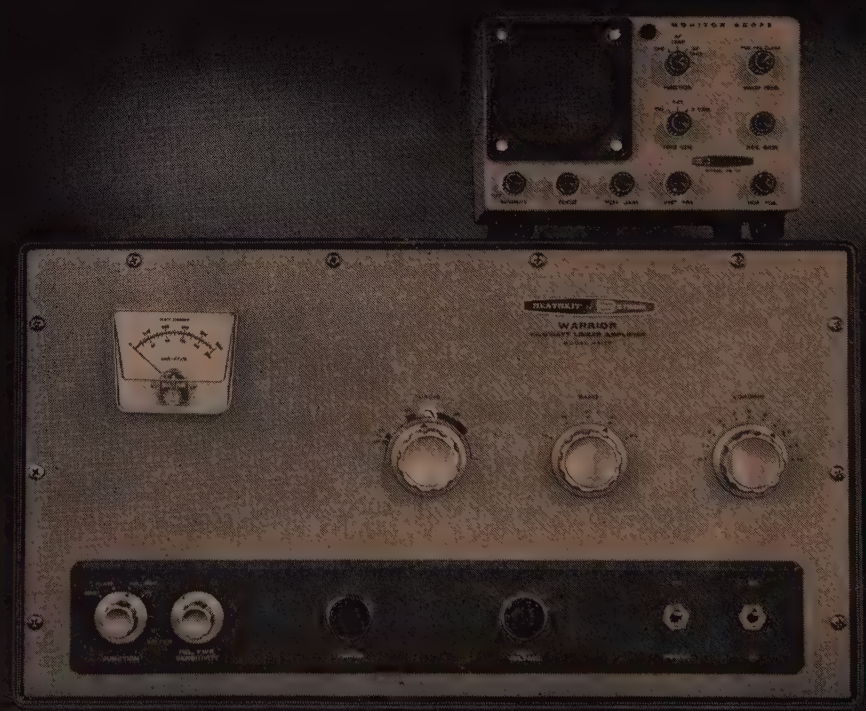

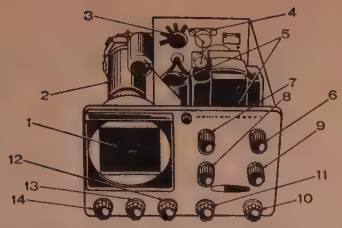

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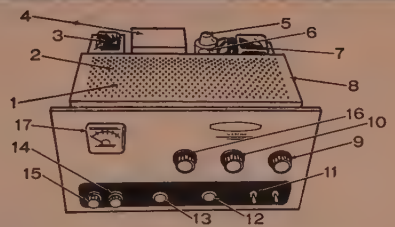

HEATHKIT DESK-TOP KILOWATT LINEAR...$229.95

1. Four 811A's **2.** Fan cooling **3.** 5-50 hy. swinging choke **4.** 8 ufd, 2 KV, oil-filled filter capacitor **5.** Two 866A's **6.** Monitor scope output with level control **7.** 1500 v. Power transformer **8.** Internal RF shielding **9.** Loading control **10.** Band switch, 80 through 10 meters **11.** Power and High Voltage interlocked switches **12.** High Voltage pilot light **13.** Power pilot light **14.** Relative Power sensitivity control **15.** Meter switch with Grid, Plate, Relative Power, and High Voltage positions **16.** Tuning control with band markings **17.** Meter

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A Flying Spot Scanner

Inexpensive Amateur TV Using The "630"

IRWIN MATH*, WA2NDM

This simple flying spot scanner was built with parts salvaged from two junked "630" TV receivers and a few additioncl parts at a cost of $25. With the line amplifier shown, it can modulate up to 10 watts of r.f.

One of the most interesting phases of the hobby today, is Amateur TV. Although admittedly amateur TV stations are few and far between, there is really no reason for this to be so. Here at WA2NDM, we have been operating A4 emission for almost two years.

The transmitter is actually a flying spot scanner, the operation of which is really quite simple. A negative is scanned by means of a moving spot of light on the face of a cathode ray tube. It is this spot of light that produces the raster on a TV screen. As the light passes through the negative, its brightness varies with the density of each point on the negative. A photo-multiplier (extremely sensitive type of photo tube) converts this varying brightness into the video signal. Thus, by inserting various negatives between the cathode ray tube and the photo tube, or by writing on the face of the c.r.t., we can produce a video signal for almost any type of message. All that is required now is to add the necessary sync signals to the basic video signal, and transmit the entire composite signal to another similarly equipped amateur TV enthusiast. A block diagram, shown in fig. 1, describes this type of system.

While not expressly intended as a construction article, this manuscript's main purpose is to show that amateur TV does not have to be an expensive undertaking. The actual cash outlay for the station to be described was approximately $25. This amount was spent for two old RCA 630 TV chassis ($5 each from a local TV repair shop), a 5FP4A surplus cathode ray tube ($5 on Canal Street in New York City), a surplus 913A photomultiplier tube ($2.50 from the same source as the c.r.t.), and the rest for miscellaneous such as the chassis, parts, *etc.* The complete circuit is shown in fig. 2 and each section is discussed in turn.

The Power Supply

The power supply is shown in fig. 2. The transformer, T_1 is the original one found on the chassis. It supplies approximately 600 volts, c.t. at more than enough current for the transmitter. Two 5U4 tubes are used in parallel for rectification. The filter choke and the electrolytics are all part of the 630 TV set. The resistors in the voltage divider which are connected to the center tap of the power transformer are also from the 630 chassis. You will have to experiment with their hookup to get the proper voltages. The only somewhat critical part of the power supply is the fixed resistor in series with the focus coil and control. This value must be determined experimentally for proper focusing action. In my set the value of this resistor is 350 ohms at 13 watts. Transformer T_2 is a vertical output transformer and is connected as shown, to the 12.6 volt filament supply. Across its secondary is approximately 650 volts which is rectified by the 6AX4 and used as the photo-multiplier high voltage supply.

The Vertical Circuits

The vertical circuits closely resemble the original vertical deflection circuit of the 630 TV receiver. The 6J5 and its associate components compromise a vertical blocking oscillator. The rate of time of discharge of the 0.0047 mf capacitor in the grid circuit, through the vertical hold control, determines the frequency of operation. While this capacitor is discharging, the 6J5 is in cutoff, and the 0.047 mf capacitor in the 6K6 grid circuit is charging through the height control. When the 6J5 grid capacitor has discharged to below cutoff, the 6J5 suddenly conducts. The result is a very short path to ground through the tube for the .047 mf capacitor and it discharges. The net result is a 60 c.p.s. sawtooth of voltage fed to the 6K6.

The 6K6 acts as a straight amplifier and is matched to the vertical deflection coils through a vertical output transformer. It will be noted that the 6K6 is triode connected. This is done to obtain the most linear amplification characteristics possible. The linearity control varies the bias of this tube and thus further controls linearity of the trace on the c.r.t. A portion of the vertical wave is fed to the video amplifier where the spike at the start of the sawtooth (due to the rapid discharge of the 0.047 capacitor through the conducting 6J5) is used as a vertical

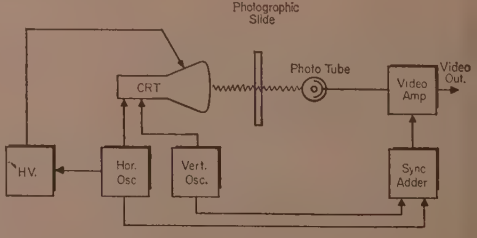


Fig. 1—Block diagram of the amateur TV transmitter.

*126B Taylor Ave., East Brunswick, N. J.

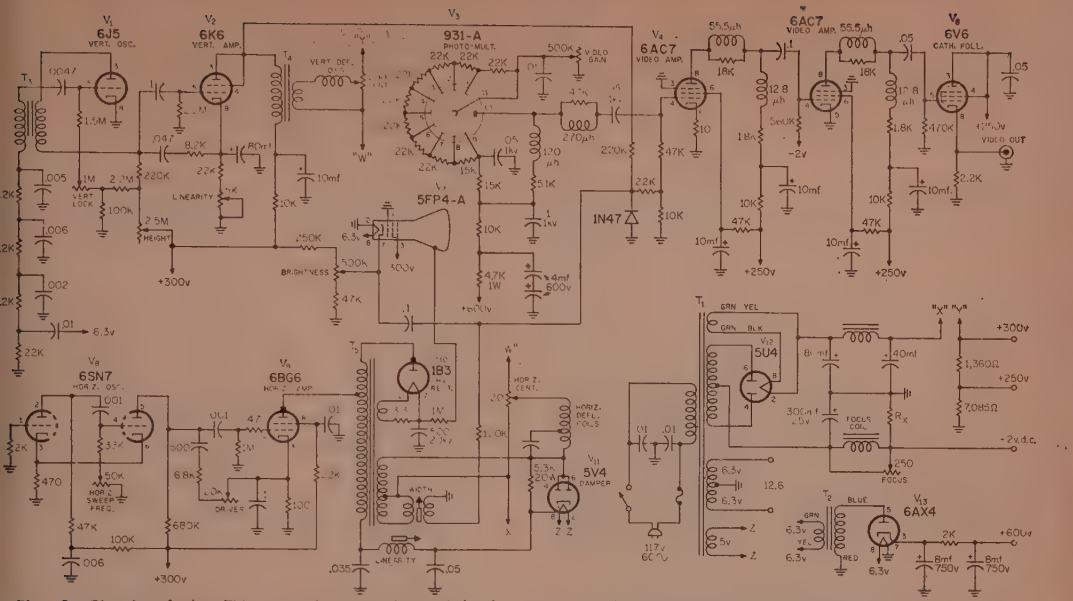


Fig. 2—Circuit of the TV transmitter made mainly from two surplus "630" receivers. The value of Rx in the h.v.c.t. must be determined experimentally and should be about 10 to 50 ohms at 25 watts. All resistors are ½ watt unless otherwise noted and all capacitors one or greater in value are in mmf, less than one in mf unless otherwise indicated. All components are taken from the "630" TV chassis unless otherwise noted.

sync pulse and for vertical blanking of the receiver c.r.t.

The Horizontal Circuit

The horizontal deflection circuit is of conventional design. The 6SN7 is a cathode coupled multivibrator whose frequency is set to 15750 c.p.s. by the 50K pot in the grid of the second half of the tube. The 500 mmf capacitor produces a sharp sawtooth between grid and cathode of the 6BG6, that is similar to the vertical sawtooth. The sharp negative peak of the sawtooth causes the 6BG6 to alternately conduct and cut-off. During the period of heavy conduction, a strong magnetic field builds up in the flyback transformer and thus, through transformer action, in the horizontal deflection coils as well. This causes the electron beam on the screen of the c.r.t. to move from the center to the right. Then when the 6BG6 is sharply cutoff, the magnetic field abruptly collapses and returns the beam to the left side of the tube. At this time the beam would normally oscillate back and forth, but the damper tube whose plate is now positive, conducts and the beam is now returned to the center of the screen. When the 5V4 damper conducts, it is in series with the B plus and the capacitor in its cathode circuit charges to something more than B plus alone. This boosted voltage is fed to the 6BG6 and enables the tube to have a higher supply voltage resulting in greater output. The sharp pulse that appears at the plate of the 6BG6 is stepped up, and fed to the 1B3 where it is rectified and supplied to the second anode of the c.r.t.

Centering in both horizontal and vertical networks is accomplished by controlling a small amount of d.c. in the respective deflection coils.

Blanking of the electron beam in the c.r.t. is caused by the positive sync pulses fed to the cathode of the c.r.t. through the .1 mf capacitor.

Special attention should be given to the 9000 volt lead. It should be at least 2 inches away from the chassis, and fashioned from high quality high voltage lead. This wire can be obtained from your source of the chassis or local parts dealer.

The Video Section

The final stage in the television modulator is the video amplifier, sync mixer, and video out-

Top view of the flying spot scanner shows the l.v. power supply on the left of the chassis. The horizontal sweep circuit and high voltage power supply are on the rear of the chassis alongside the 5FP4A. The vertical circuit is located in the front center and the video strip front right. The 931-A photo-multiplier is in front of the c.r.t. This unit uses a permanent magnet focusing device and, if used in the unit constructed, the h.v. center tap is run directly to the dropping resistor R_x in fig. 2.

put stage. It is in this portion of the entire transmitter that the composite video signal is formed.

Light from the c.r.t., after being modulated by passing through the slide we wish to transmit, is allowed to fall on the sensitized cathode of a photomultiplier tube. Electrons are emitted and due to the construction of the tube encounter the string of dynodes. As the electron stream strikes each dynode, more electrons are emitted with the final result that the original signal is amplified many thousands of times. The photomultiplier obtains its voltage from the string of resistors connected to the 600 volt supply. The 500K pot located at the end of this voltage divider network, varies the gain of the tube, and thus provides a type of contrast control. The amplified signal now appears across the 5.1K resistor and peaking coil in the plate circuit of the photomultiplier. It is then capacitively coupled to the grid of the first video amplifier along with horizontal and vertical pulses which are "shaped" by the 1N47 diode. The signal in the plate circuit of the first 6AC7 is the composite video signal. It in turn is further amplified by another stage of 6AC7 and finally appears in the cathode circuit of the 6V6 as the video signal. The entire video section is designed to have a band width of approximately 5 mc and thus the reason for the peaking coils and low value plate load resistors. Approximately 2½ to 3½ volts of video are obtained from this amplifier. This video can be fed directly to the video amplifier of a normally operating television receiver to check on linearity of the transmitter, or fed to a control-tube modulator for amplitude modulation of a 432 mc transmitter. The simplified schematic in fig. 3 shows a type of transmitter modulator suitable for up to about 10 watts of r.f. Other circuits for similar devices can be found in *CQ*[1].

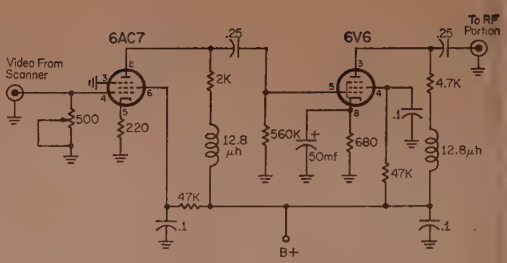


Fig. 3—Circuit of a video line amplifier that may be used to modulate a 10 watt r.f. unit.

The many problems which arose in building and designing the station have taught the author a great deal about television techniques. As one learns more about the fascinating topic of video emission, many improvements and refinements will produce better and better pictures. As an example, although the transmitter described here was used for 2 months with a fair quality picture, at present the entire video section is undergoing complete revamping. The result will be a more stable picture and eventually the result may be an amateur television station, comparable to commercial equipment. ■

[1]SURPLUS, *CQ*, May 1957, page 28.
Kaiser, M. L., "A U.H.F. Television Transmitter," *CQ*, April, 1962, page 26.

We are indeed sad to report the death, of Bill Petersen, WØJRY, founder and president of the Petersen Radio Company, one of the world leaders in the manufacture of quartz crystals for electronics.

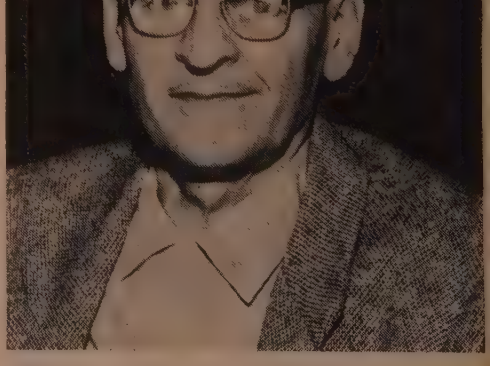
Born in Minden, Iowa in 1899, Bill soon moved to Canada where he spent a good part of his youth, and later enlisted in the Canadian Army during World War I. He returned to the United States after the war and came to Council Bluffs after holding W7AHE out west. He later held W9JRY in the early thirties and later, WØJRY.

Finding it difficult to obtain good crystals for his amateur work, he began cutting and polishing his own in the basement shack, and later founded the company which bears his name.

During World War II, Bill's factory operated on an around-the-clock basis, turning out crystals twenty-four hours a day, seven days a week, for almost five years.

Before Bill's illness he was very active on the air and was a believer in big arrays. He was one of the earliest amateurs to use a rotating tower and thousands will remember hearing his "Corn-fed Kilowatt" from "Kilowatt Ridge."

Bill succumbed to an illness which kept him in and out of bed for almost four years. He is survived by his widow, Doris, and son, Bill, Jr., KØCYE, who will take his dad's place as president of the company.



WILLIAM P. PETERSEN, WØJRY, 1899-1963

A Transistorized Converter for 80 or 40

BY J. J. D. MATHON*, VE1IC

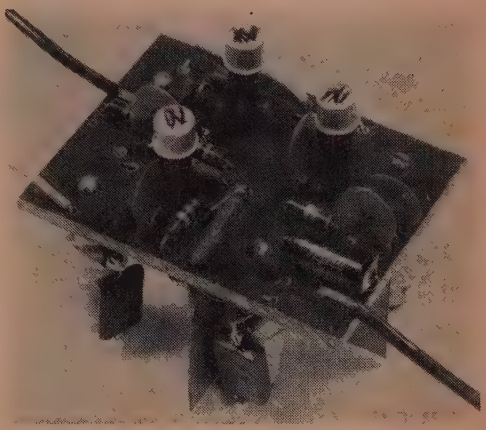
This simple transistorized converter for 80 or 40 meters can be built at low cost. It is both compact and stable thus ideal for mobile work.

AFTER building a tube type mobile transmitter and a transistorized modulator, I started thinking about a converter. Since there was no high voltage available in the car during reception periods, I decided to build the converter using transistors. I looked at a few already published circuits but found them to be too expensive or else using too many parts that were not available in the junk box, so, I decided to design my own and the one discussed here is what I came up with.

Description and Circuit Analysis

The converter uses three Texas Instruments 2N1304 if built for 80 meters or 2N1306 if built for 40 meters. These transistors sell for $0.62 and $1.12 respectively. (Cheaper than tubes even!) For simplicity and compactness, the unit is built on a printed circuit board measuring only 2¼" × 3".

Figure 1 shows the schematic diagram which is almost self explanatory. The antenna is connected to a tap on the coil so that a low input impedance may be obtained to match the impedance of the mobile antenna. Incoming signals are fed to the base of the r.f. amplifier via a low impedance link, the low side of which is effectively grounded for r.f. by C_2. These signals are amplified by Q_1 from where they are fed to the mixer via two low impedance taps on the mixer coil and capacitor C_5. The use of taps on L_3 prevent it from being loaded too heavily by the low impedance of the transistor which would lower its Q considerably. The incoming signals are then mixed with a local oscillator signal which is injected in the mixer stage, via the emitter, from a low impedance link on the oscillator coil. The difference in frequency of



The 80 or 40 meter converter as viewed from the component side of the board. The shield is just visible beneath as it wraps around L_1 on the right.

*P.O. B 516, Middleton, N. S., Canada.

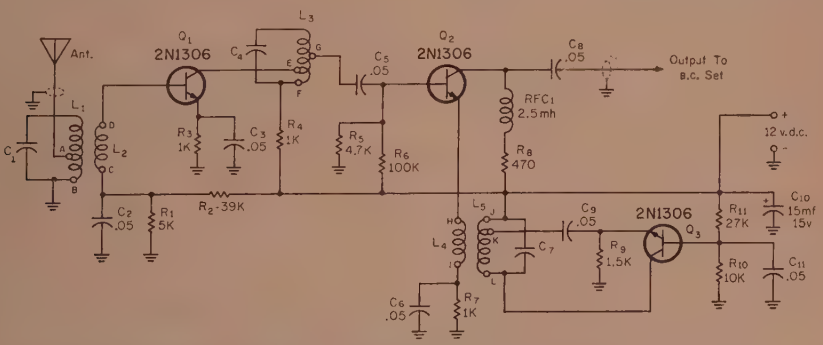


Fig. 1—Circuit of the transistorized 80 or 40 meter converter. All resistors are ½ watt and all capacitors are disc ceramics in mf unless otherwise noted.

C_1, C_4—80 meters—100 mmf mica.
40 meters—30 mmf mica.
C_7—80 meters—120 mmf, silver mica.
40 meters—30 mmf, silver mica.
L_1—48t #26E on 5/16" dia. slug tuned form ¾" long, tapped 10 turns from ground end.
L_2—10t #26E wound over the center of L_1.
L_3—48t #26E on 5/16" dia. slug tuned form ¾" long, tapped 10 turns from F terminal and 12 turns from F terminal.
L_4—10t #26E wound over the center of L_5.
L_5—48t #26E on 5/16" dia. slug tuned form ¾" long, tapped 8 turns up from L terminal.

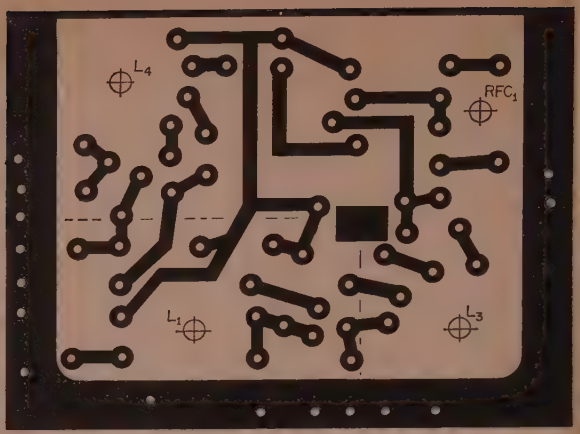


Fig. 2—Diagram of the printed circuit board. The dark area indicates where the copper is to remain. The scale is 1:1.

the two signals is then fed to the broadcast receiver through C_8 The r.f. choke prevents the r.f. from being bypassed to the 12 volt line.

The oscillator is a standard grounded base Hartley type. The feedback for sustained oscillation is obtained from a tap on the coil and fed to the emitter through C_9. Resistors R_1-R_2, R_5-R_6 and R_{10}-R_{11} combinations are voltage dividers to provide base bias for their respective transistors. Resistors R_3, R_7 and R_9 are current limiting resistors to prevent thermal runaway. Resistors, R_3 and R_7 are bypassed to ground by C_3 and C_6 in order that the r.f. and mixer stage may be operated in a grounded emitter configuration. Resistors R_4 and R_8 are for decoupling. Capacitor C_{10} is used to bypass any stray r.f. to ground and prevent feedback between each stage while C_{11} effectively grounds the base.

Construction

The construction of this converter is quite simple. If the printed circuit is used, fig. 2 printed at a scale of 1:1, may be reproduced on the copper clad with a carbon paper. The resist is then applied, (strips of plastic tape were used here) and the board is etched following the instructions for the particular type of solution used. When the etching process is completed, the resist is taken away and holes, 1/64" in diameter are drilled in the center of the circular area terminating each wire. Holes of that size will also have to be drilled in the ¼" copper strip on the edge of the board as indicated in fig. 2. The location of these holes may be marked on the board (the components side) using carbon paper and fig. 3. All those points which fall within ¼" of the edge of the board should be marked and drilled. The next step is to make the necessary holes for the coils and r.f. choke. The dimension for those holes is not given since they will depend on the type of component used. The mounting center is indicated however in fig. 2. Mounting holes will then be drilled in each corner of the board. The resistors, capacitors and transistors may now be mounted in position as indicated in fig. 3 and soldered. The coils are mounted on the board and capacitors C_1, C_4 and C_7 mounted directly on their respective coils and soldered. The different wires coming from the coils will then be soldered to their proper position as indicated by the letters "A" to "L" in both figs. 1 and 3. The choke is then placed in position and soldered. The input and output coax as well as the plus and minus 12 volts leads are also soldered. A shield is then cut from thin galvanized material as shown in fig. 4 and bent at a 90° angle where indicated by the dotted lines. This shield is then soldered to the board with its center leg resting on the square area of

[*Continued on page 96*]

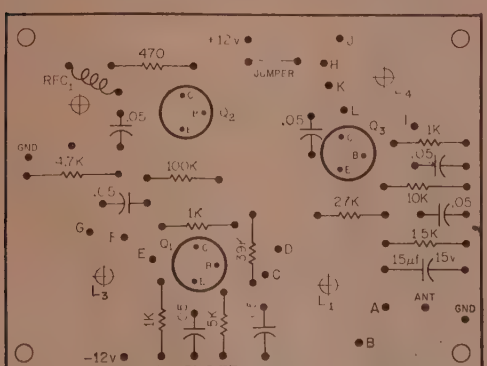


Fig. 3—Component side of the board shows parts location.

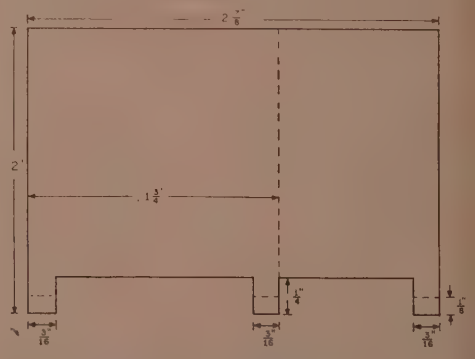


Fig. 4—Shield, cut from thin galvanized stock, is bent on the dotted line and soldered down around L_1 as shown in the photograph.

CQ Reviews:

The Knight-Kit P-2 SWR/Power Meter

BY WILFRED M. SCHERER*, W2AEF

A STANDING-wave-ratio and relative-power meter provides a means for determining the adjustment of the antenna system which results in the lowest s.w.r.; indicates the relative loss of power due to a particular s.w.r., and indicates relative transmitter output-power into the line for tune-up purposes. It will thereby serve as a useful tool toward the attainment of the best overall efficiency. Once the system has been tuned up, the instrument may be left in the line and used as an r.f. output monitor, an indicator that the transmitter is being modulated and will provide an instant check of any changes in the s.w.r. due to any malfunction in the antenna system.

The Knight-Kit® Model P-2 SWR/Power Meter is one such device which is available in kit-form at a price just under $15.00.

It consists of two small boxes, one of which is the "sampling" or pickup unit, the other is the metering unit. The pick-up unit is a reflectometer which contains the equivalent of a short section of transmission line with two separate pick-up elements inductively and capacitively coupled to the hot side of the transmission-line section. One element is for the forward wave, the other is for the reflected wave. A crystal diode is connected to each pick-up element to rectify the r.f. potential induced therein, producing a reading on a 0-100 μa d.c. meter which may be switched from one diode to the other.

Dual Arrangement

The meter, a SENSITIVITY control and the FORWARD-REFLECTED-POWER switch are mounted in the second box which is connected to the pick-up box with a four-foot length of cable. This dual-unit arrangement, a feature not found in many other similar devices, is a convenience which permits the meter to be placed at a suitable location near the operating position for viewing and monitoring, while the pick-up unit is inserted in the transmission line at the rear of the transmitter.

The pick-up unit also contains terminating resistors for each coupling element to provide a proper match with the transmission line. Two sets of resistors are furnished so that the unit may be constructed for use with either 52- or 72- ohm lines.

The frequency range of the instrument is 1.8 to 432 mc and the minimum power required for full-scale deflection of the meter (FORWARD direction) is 45 watts at 1.8 mc, dropping off to ½ watt at 432 mc. At 27 mc the power requirement is about 1 watt, making it suitable for Citizen-Band use. The maximum r.f. power handling capability is 1 kw. The unit may be left connected in the line at all times. The meter has two scales; one calibrated in terms of standing-wave-ratio from 1:1 up to 20:1, the other in terms of relative power from 0.1 to 10.

The Knight-Kit SWR/Power Meter.

Construction

Assembly of the Model P-2 is quite simple and will consume from 1½ to 2 hours of time when the step-by-step procedure, described in the Assembly Manual, is used.

A few suggestions regarding the assembly instructions are as follows: In fig. 1, page 5, the direction of the flange at the bottom of the meter sub-panel may not appear quite clearly. This flange is "going away" from the reader.

In the last step on page 8, the two 4" lengths of the large bare wire should be made as straight as possible before they are mounted.

The connecting and soldering of the crystal diodes, as indicated on page 12, will be better left until last. First solder all the points to which the diodes eventually will be connected. Then "spot" solder each diode lead while it is held with a pair of long-nose pliers. This provides a heat sink which will minimize the possibility of damage to the crystals due to overheating.

Alignment, operating and trouble-shooting instructions are also included in the Manual.

Operation

Ordinarily no special adjustment is needed for use at frequencies below 30 mc, but a slight adjustment on the pick-up elements may be needed at higher frequencies. In our case, no difficulties were encountered in this respect and a correct 1:1 s.w.r. null was obtainable well up into the higher-frequency range.

The following points regarding the operating instructions should be noted: In the first paragraph on page 14 regarding the placement of the

[*Continued on page 90*]

*100 E. Palisade Ave., Englewood, N. J.

Announcing

The Spring 1963 *CQ* VHF Contest

May 4-5, 1963

I. CONTEST PERIOD

The duration of this contest is twenty-four (24) hours, starting at 1 P.M. local time, Saturday, May 4, 1963, and ending 1 P.M. local time, Sunday, May 5, 1963. Contacts between time zones will count only when both time zones are participating in the contest.

II. BANDS

All bands, 50 mc and above may be used for this contest.

III. COMPETITION

Three categories of competition are offered in this contest.

A) GENERAL

This group includes multi-operator stations using only *one* band, and *all* single-operator stations regardless of band or bands used.

B) ALL BAND, MULTI-OPERATOR

This group includes all stations operating more than one band and using more than one operator.

C) CLUB AGGREGATE

In addition to a station submitting his score for individual credit, he may also apply his score to his club's total. Logs from categories A and B, above, may be submitted for club aggregate credit. Club members should clearly mark logs as being submitted for club aggregate total.

IV. EXCHANGE

Exchanges will consist of the following information: Signal Report, Serial Number, County and State. The serial number of each band shall consist of the signal report followed by a three digit number beginning 001. Failure to start with 001 will result in disqualification. Example: 59001 (phone), 579001 (c.w.). Contestants call "CQ Contest" on phone and "CQ TEST" on c.w.

V. CONTACT POINTS

Contacts between stations worked for the first time on the same band will count one (1) point. One-way contacts do not count. Mobile-in-motion contacts of any kind will count only for contact purposes and *not* for county multipliers.

VI. MULTIPLIERS

Three types of multipliers will be used in this contest.

A) COUNTY

A multiplier of one (1) will be allowed for each *new* county worked on each band.

B) HOUR

A multiplier of one (1) will be allowed for each hour of station operation during which at least *one* contact is logged. The maximum number of multiplier hours allowed for any station in any category will be twenty-four (24).

C) POWER

A multiplier of 1.25 will be allowed for stations which at no time during the contest period run in excess of 50 watts input on any band. Stations exceeding 50 watts input will use a power multiplier of one (1).

VII. LOG INSTRUCTIONS

A) Use separate log sheets for each band. (Logs available from *CQ* — Please include a large self-addressed envelope).

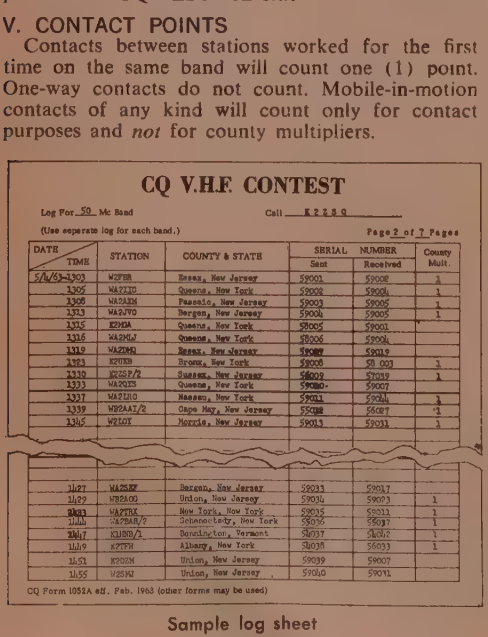
B) All times are to be kept in *local* time.

C) Fill in the date (required only once), time, call, county and state, serial number sent and received. PRINT or TYPE.

D) All contestants are expected to compute their own scores. Logs should be checked for duplication and proper point and multiplier credit before submission.

E) Be sure to include a signed pledge stating that all rules have been obeyed and that all logged data is accurate. This pledge is included on standard summary forms also available from *CQ*.

[*Continued on page 86*]



CQ V.H.F. CONTEST

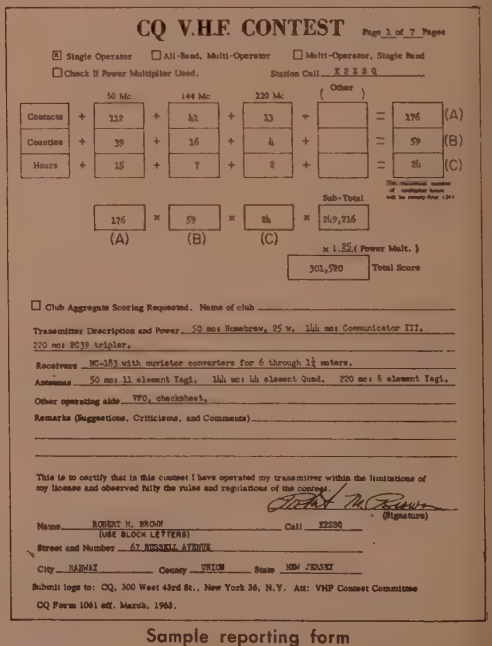
Log For 50 Mc Band Call K2ZSQ

(Use separate log for each band.) Page 2 of 7 Pages

DATE / TIME	STATION	COUNTY & STATE	SERIAL NUMBER Sent	SERIAL NUMBER Received	County Mult.
5/4/63-1303	W2FSR	Essex, New Jersey	59001	59002	1
1305	WA2IID	Queens, New York	59002	59001	1
1306	WA2AXM	Passaic, New Jersey	59003	59005	1
1313	WA2UVO	Bergen, New Jersey	59004	59005	1
1315	K2VDA	Queens, New York	59005	59001	
1316	WA2MLV	Queens, New York	59006	59004	
1319	WA2DMQ	Essex, New Jersey	59007	59019	
1323	K2UES	Bronx, New York	59008	58 003	1
1330	K2SDV/2	Sussex, New Jersey	58009	57039	1
1333	WA2KZS	Queens, New York	59010	59007	
1337	WA2IIO	Nassau, New York	59011	59011	1
1339	WB2AAT/2	Cape May, New Jersey	55012	55087	1
1345	W2LOY	Morris, New Jersey	59013	59031	1
1427	WA2SKE	Bergen, New Jersey	59033	59017	
1429	K2ZAQ	Union, New Jersey	59034	59003	1
1433	WA2TRK	New York, New York	59035	59033	1
1440	WA2BAR/2	Schenectady, New York	59036	59037	1
1447	K1NDB/1	Bennington, Vermont	59037	56047	1
1449	K2TFH	Albany, New York	59038	56033	1
1451	K2UZM	Union, New Jersey	59039	59007	
1455	W2SMJ	Union, New Jersey	59040	59031	

CQ Form 1052A eff. Feb. 1963 (other forms may be used)

Sample log sheet



CQ V.H.F. CONTEST Page 1 of 7 Pages

☒ Single Operator ☐ All-Band, Multi-Operator ☐ Multi-Operator, Single Band

☐ Check If Power Multiplier Used. Station Call K2ZSQ

	50 Mc	144 Mc	220 Mc	Other		
Contacts	119	42	13		= 176	(A)
Counties	39	16	4		= 59	(B)
Hours	15	7	2		= 24	(C)

Sub-Total 249,216

176 (A) × 59 (B) × 24 (C)

x 1.25 (Power Mult.)

301,520 Total Score

☐ Club Aggregate Scoring Requested. Name of club

Transmitter Description and Power 50 mc: Homebrew, 85 w. 144 mc: Communicator III, 220 mc: 2C39 tripler.

Receivers NC-183 with nuvistor converters for 6 through 1½ meters.

Antennas 50 mc: 11 element Yagi. 144 mc: 4h element Quad. 220 mc: 5 element Yagi.

Other operating aids VFO, checksheet.

Remarks (Suggestions, Criticisms, and Comments)

This is to certify that in this contest I have operated my transmitter within the limitations of my license and observed fully the rules and regulations of the contest.

(Signature)

Name ROBERT M. BROWN (USE BLOCK LETTERS) Call K2ZSQ

Street and Number 67 RUSSELL AVENUE

City NARWAY County UNION State NEW JERSEY

Submit logs to: CQ, 300 West 43rd St., New York 36, N.Y. Att: VHF Contest Committee

CQ Form 1061 eff. March, 1963.

Sample reporting form

Modifying the DSB-100

BY DAVID T. GEISER*, WA2ANU

The author has made some simple improvements in the areas of v.f.o. input, speech processing, TVI elimination and output coupling.

THE DSB-100 will deliver about 18 watts a.m., 40 watts c.w., and about 60 watts peak d.s.b. to a 50 ohm antenna. The final nplifier is a push-push stage acting as a well-lanced balanced-modulator on d.s.b.; with one the tubes disabled on c.w. and a.m., the other be acts as a neutralized class C final. Very ıear a.m. is possible with the screen modulation ethod used. Speech clipping and filtering gives e little rig much more punch than the carrier ıtput power would seem to warrant. Provisions e made for v.f.o., vox, and QT operation. An ternal tone generator is useful for sideband ıd other modulation tests.

It was a real problem finding anything to odify, much less justify. Casting about for ways at the DSB-100 *might* be used or ways it is ɔssible to get more out of it than was designed to it, the author *did* find some improvement ɔssible in the fields of v.f.o. input, speech ocessing, TVI, and output coupling.

V.F.O. Input

The DSB-100 is designed to work with the RL Globe 755 v.f.o. This v.f.o. is a real power-ıuse, as v.f.o.s go. Many other makes of v.f.o. ıt out insufficient r.f. to adequately drive the SB-100, and the author's Johnson Viking 122 f.o. was no exception. The difficulty appeared ıly on 80 meters.

The culprit was easy to find—the oscillator ıge had practically no gain on 80 when con-ected as a v.f.o. buffer. As a matter of fact, on) meters, the oscillator plate is tuned to 40! Believe me, there was good reason for it.) So e next step was to purchase a switch deck Centralab PA-1) and a 500 microhenry r.f.c. National R-50). The new switch deck would ermit switching in a high impedance choke in-ead of the 40 meter tank during 80 meter oper-ion. This should give more gain.

It oscillated wildly! After much searching, the edback path was found to be from the final nplifier cathode back to the oscillator cathode. nother r.f.c. at the bottom of RFC_1 (see fig. 1) osed that path, and swamping resistors across e new plate r.f.c. gave all the stability anyone ould desire.

Speech Processing

The DSB-100 incorporates speech clipping and tering, capable of giving several db improve-ent in effective talk-power. The only disadvan-tage of such a system is that it tends to emphasize the low frequencies in a voice. This is because clippers favor the high-power parts of a signal, and lower frequencies are stronger in the human voice. Actually, in the voice, 4,000 c.p.s. components average 20 db or so weaker than the 400 c.p.s. components. The power falls off approximately logarithmically over this range.

Interestingly enough, this attenuation can be almost exactly compensated for with a single resistor and capacitor audio coupling having a low-frequency cutoff of 4 kc. This way, both the high and the low frequencies in the voice (up to about 4 kc) have an equal opportunity to benefit from the clipping. If you wish, you can convert the vox amplifier stage to give the extra gain necessary, or you can do as the author did, and build a little outboard amplifier (fig. 2).

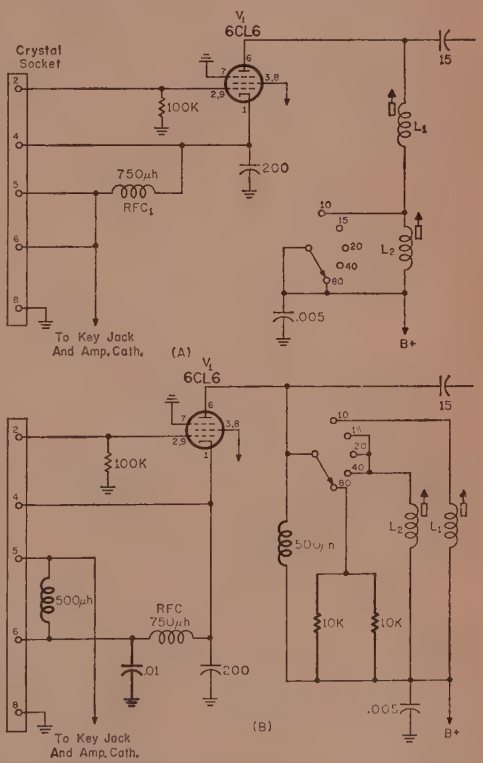


Fig. 1—Circuit (A) is the DSB-100 oscillator before modification. Circuit (B) shows all parts added for the modification in bold. Capacitances less than 1 are in mf, greater than 1 in mmf.

ight Military Electronics Dept. General Electric Co., ica, N. Y.

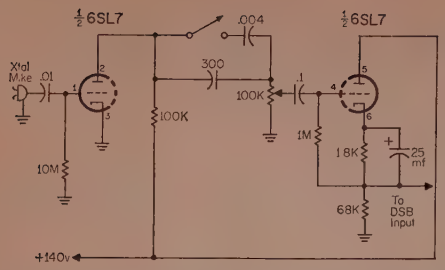


Fig. 2—This preamplifier when used with the DSB-100 can provide either a normal response or a high boost of 4000 c.p.s. cut off and 20 db down at 400 c.p.s.

Interesting things happen when this amplifier is used. First, when conditions are rough, nobody notices the peculiar "quality" it gives the voice, but the communications go through. Much of the highs that are lost ordinarily when a crystal or mechanical filter or Q multiplier are used *do* come through, giving much higher intelligibility. Heavy clipping no longer sounds bassy. The filter in the DSB-100 cuts off all the "hiss" above 3 kc and keeps the signal narrow.

Under clear channel no-interference conditions when the other station is receiving with broad i.f., the other station, if asked, will say he prefers the untreated audio. This is to be expected, for the audio does not sound natural.

The receiving station can restore a great deal of the natural sound (and cut down QRM, to boot) by use of a 300 c.p.s. low-pass RC filter in his receiver audio. Tilting the speech spectrum and then tilting it back at the receiver gives speech the best possible chance to compete with natural and man-made interference. A simple receiver filter suitable for any class A audio grid is shown in fig. 3.

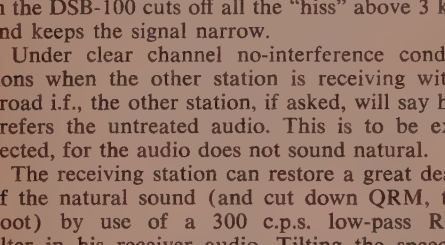


Fig. 3—Normal audio spectrum can be restored at the receiver as shown above. When a gain control appears in the circuit, break the connection as shown at X. The capacitor value may range from 0.0047 to 0.047 to suit the listeners taste.

TVI

The DSB-100 should be used with a low-pass antenna filter when operating on 10 meters. Even without any other protection, it then falls into the "I don't bother the neighbors" class. This weasel-worded but common statement usually means that something appears on the ham's own TV, and its truthfulness is somewhat dependent on the distance to the nearest neighbor.

To eliminate any possibility of family unhappiness, the top and bottom should be shielded with perforated Reynolds aluminum. If the rig

Perforated aluminum makes neat inner case to assi TVI prevention in weak-signal areas.

is being built up from a kit, a job as shown i the photograph can be accomplished. If a com plete unit is purchased, glue aluminum foil t the back of the front panel and make a wrap around shield secured to the front panel b machine screws and to the rear of the chassi by the control and socket mounting nuts an bolts. (Remember, before you even start thi shielding, in your case, there is a very goo chance that adding *any* shielding or filtering i unnecessary.)

For the purist, what radiation remains come out of the front panel on the key leads an through the meter face. The key leads may b calmed down with a series Ohmite Z-50 chok and a shunt 470 mmf disk ceramic capacito with short leads *right at* the key jack. To elim nate meter radiation, cut down a tin can (Camp bell's Soup is a convenient size) leaving four tab to fit under the meter mounting screws. Mour two Erie ceramic feedthru capacitors (.001 mf in the bottom of the can to carry the d.c. throug the shield while filtering out the r.f. Yes, a litt radiation comes out the back leads, but eve the author couldn't find fault with it. Should ever be troublesome, however, the Ohmite chok and disk ceramic cure should be effective a shown in fig. 4.

Output Coupling

Feeding a low-impedance antenna is always difficult job for a transmitter that has a tub final amplifier. The problem is that a tube like to work (from the efficiency standpoint) into

[*Continued on page 94*]

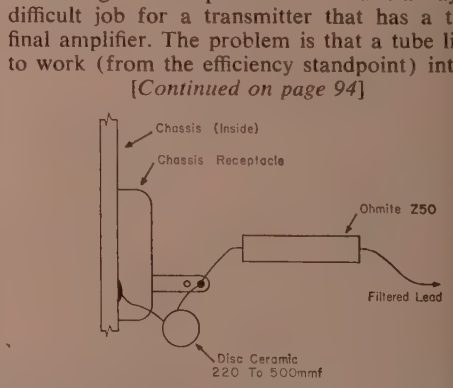


Fig. 4—A simple TVI filter for any emerging leads th may be causing radiation. Connections near the r ceptacle must be extremely short and direct.

Results of the April 1962 *CQ* W.W. V.H.F. Contest

COMPILED BY BOB BROWN*, K2ZSQ

In the eyes of many battleworn v.h.f. operators, here was one contest not soon to be forgotten. The weekend of April 14-15, 1962, brought most of the country high winds, sleet, rain, and snow, to the utter dismay of many aspiring mountaintoppers. Not a single Sporadic E or auroral contact was reported, nor for that matter were there any really good ground wave contacts. Conditions in a word: *nil.* But amid all these catastropic disilliusionments came news from W6NLO/6 that the California weather was "sunny" and band conditions "superb." Alas . . .

In spite of the pickle most stations were in, however, great numbers of contesters rallied together and put forth a really magnanimous effort. It seemed to do the trick. The big surprise, though, came from Allen County, Indiana, wherein dwells K9GFQ. Larry piled up 163 QSOs in 53 counties on 50 mc for the overall world-high entry in this contest. His total of 207,336 points was undoubtedly aided in its accumulation by Larry's homebrew p.p. 826 transmitter, running three hundred watts to a pair of five element Yagis stacked at a height of 75 feet. Close behind K9GFQ was Stan Smith, K3IPM, of Philadelphia, Pennsylvania, who placed second high worldwide (plus taking the Pennsylvania state certificate) in the 50 mc competition with his 203,960 points. We'd hate to think just what might happen if Stan and Larry ever got together for a contest . . .

Moving over now to two meters, we find the Stewart Air Force Base station, K2FCO/2, in Orange County, New York, leading the pack in the s.b.m.o. classification with an outsanding 165,888 points envolving 192 QSOs in 36 counties. Note to 144 mc skeptics: approximately 18% more contacts were made by K2FCO/2 on 2 meters than by K9GFQ on 6, although K9GFQ did rack up 32% more counties. We feel, though, that this is due, in part at least, to his locale. So who says a two meter station can't be a winner?

Desmond Goggins, K9RVG, of Cook County, Illinois, cleaned up in the 144 mc s.b.s.o. category with his 38,220 points to hit the top in that division as well as taking the Illinois state certificate. Desmond mentions that his rig was a v.f.o.-controlled Viking 6N2 into an eleven element Yagi.

An interesting entry was submitted from the seven-operator station of W9BF, the Tri-State College Amateur Radio Club, in Angola, Indiana. These boys made 182,448 points on 50 mc using both a.m. *and f.m.!* It was established years ago that many v.h.f. stations use solely the f.m. mode, but in the past these amateurs appear to have been hesitant in entering contests. Well, the group at W9BF have proved it can be done. W9BF took top honors in the 50 mc s.b.m.o. division.

Another winner, Dave Vore, K8UQA, of Cuyahoga County, Ohio, piled up 225 QSOs in 32 counties for a grand total of 154,146 points on both 50 and 144 mc. Dave brought out something that many Ohio stations reported: "All the boys in the Cleveland area had trouble with a very high noise level, traced to an arcing condition in the transmission line at one of the local 50,000 watt TV stations. This existed for hours, causing severe 20 db over S9 noise levels for miles around on six meters. This is the main reason for the numerous low scores here." *Everything happens come contest time.*

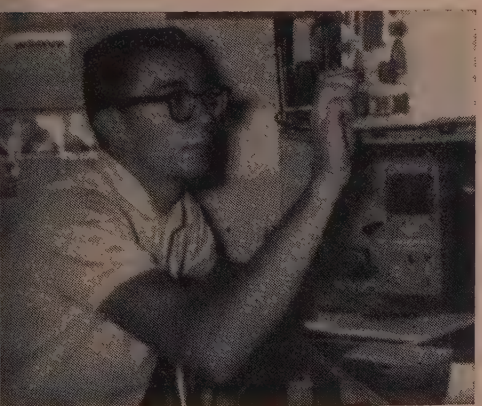
Sheer endurance on the part of six operators on a mountaintop resulted in 66,752 points for WA2BAH at Albany, New York. These boys battled rain, sleet and snow with their Viking 6N2's, only to lose ten hours of operating time due to TVI complaints.

Summing Up

All in all we were quite pleased with the participation shown on that formidable weekend. I remember one chap commenting on the contest activity the following Monday who said, "If a guy can make a go out of *that contest*, he can win *anything.*" More true words were never spoken . . .

Next *CQ* V.H.F. Contest, May 4-5, 1963.

*Editor, *The VHF Amateur.*



Meet Stan Smith, K3IPM, of Philadelphia, Pa., who not only took top honors in the 50 mc s.b.s.o. state category, but also placed second worldwide with his 204,960 points.

Single Band, Single Operator

Number groups after call letters indicate the following: number of contacts, number of counties worked, hour multiplier, and final score.

50 Mc

California

WA6LGE	40	8	9	2,880
WA6BCN	38	8	8	2,432
K6KQD	40	7	8	2,240

Colorado

KØLES	28	4	7	784

Florida

WA4DMV	50	3	9	1,350

Georgia

K4FOW	104	31	19	61,256

Illinois

K9DWR	159	17	24	64,872
K9HDE	166	16	24	63,744
K9GHR	144	13	24	44,928

Indiana

K9GFQ	163	53	24	207,336
K9BJN	64	20	17	21,760

Maine

K1NAY/1	47	17	8	6,392
K1VAW/1	16	11	1	176

Maryland

K3MOY	22	8	5	880
K3OCN	14	3	2	84

Massachusetts

K1PLX/1	74	11	17	120,528

Michigan

K8OIB	122	8	24	23,424
K8IXU	48	14	10	6,720
K8TWW	21	2	4	168

Minnesota

WØTRD	74	11	17	13,838
KØQGL	11	4	2	88
KØVPL	6	3	1	18

Missouri

KØSBJ	84	8	16	10,752
WØCMI	69	6	14	5,796

New Hampshire

K1KOB	6	4	3	72

New Jersey

WA2BDP	55	17	11	10,285
WA2UOA	50	11	7	3,850

New York

WA2LRO*	196	30	23	135,240
K2CBA	148	36	24	127,872
K2SWI	122	24	24	70,272
WA2SPL	90	11	19	18,810
K2PBU	66	22	9	13,068
WA2WDD	36	15	24	12,960
WA2JFZ	38	9	9	3,078
K2YIH	30	4	6	720

Ohio

W8UMF	200	37	22	162,800
WA8AHU	144	18	23	59,616
K8LCC	153	12	24	44,064
K8LSB	124	9	24	26,784
W8CZD	63	25	12	18,900
W8KKF	50	9	10	4,500
K8PBE	41	13	7	3,731
K8SKX	15	11	3	495
W8IBX	17	2	4	136
W8RRB	13	5	1	65

Pennsylvania

K3IPM	244	35	24	204,960
K3HGA	216	30	24	155,520
W3ETB	121	21	21	53,361
K3LNU	78	20	13	20,280
K3HNP	43	18	8	6,192
K3MKZ	53	4	12	2,544
K3LVO	9	4	1	36

South Carolina

W4VIW	9	6	1	54

Tennessee

K4VKJ	121	28	20	67,760
WA4EPY	67	28	12	22,512
WA4AUX	61	14	22	18,788

Texas

K5ARU	99	7	22	15,246

Washington

K7QQZ	101	6	24	14,544
W7VTW	41	5	7	1,435

Wisconsin

K9KBL	55	19	9	9,405
K9VNM	40	5	18	3,600

*CQ Staff, not eligible for awards.

144 Mc

Colorado

WØDKA	13	7	2	182

Connecticut

KN1TLA	21	6	16	2,016
K1PLR	10	5	2	100

Illinois

K9RVG	140	13	21	38,220
W9CCR	119	13	22	34,034
K9ECZ	91	12	19	20,748
W9BQL	82	12	15	14,760
K9DMW	86	5	23	9,890
K9VTT/9	69	11	11	8,349
K9ZWU	70	8	14	7,840
K9EEC	78	6	15	7,020
K9HOW	35	8	5	1,400
K9CGD	33	2	5	330
W9NW	30	5	2	300
WN9DMB	23	3	3	207
WN9DMF	23	3	3	207
K9VLW	17	2	4	136
WN9DBA	8	2	1	16
K9GVO/9	13	1	1	13

Indiana

K9WZB	54	16	23	19,872
K9VXW	61	9	10	5,490

Massachusetts

K1MNO	9	2	2	36

Michigan

W8ZGW	53	13	15	10,335
K8NGR	34	9	7	2,142
K8HEG	27	7	5	945
W8VRH	26	6	5	780
K8VPH	21	2	4	168
K8IFL	4	2	1	8

New Jersey

WA2NMX	80	21	18	30,240
WA2VLE/2	28	11	5	1,540
K2ZSP	21	10	2	420

New York

K2RTH	92	21	15	28,980
K2GSF	66	19	14	17,556
WA2YLL	62	13	21	16,926
K2LOK	40	7	10	2,800
WV2VKK	20	10	4	800

North Carolina

K4GPL	73	10	22	16,060
WA4CCK	73	10	22	16,060
K4HGE	73	11	19	15,257
WA4AJI	67	9	18	10,854
WN4FLU	67	9	18	10,854
K4MHS	46	14	14	9,016
K4GBD	56	8	12	5,376
W4RRK	31	5	9	1,395
W4MKT	31	7	5	1,085

Ohio

W8VOF	100	16	18	28,8[illegible]
K8RXD	23	8	5	9[illegible]
WA8DBI	11	4	2	[illegible]

Canada

VE3APF	53	14	15	11,1[illegible]
VE3EUH	25	6	8	1,2[illegible]

England

G2DHV/P	25	11	6	1,6[illegible]
G3IAS	7	5	1	[illegible]

Single-Band, Multi-Operator

Number groups after call letters indicate the following: number of contacts, number of counties worked, hour multiplier, and final score.

50 Mc

W9BF	181	42	24	182,44[illegible]
K2VNR	228	27	24	147,7[illegible]
WA4EOZ/4	120	35	20	84,0[illegible]
K3HKK/3	108	26	24	67,3[illegible]
K1HNB/1	102	26	21	55,6[illegible]
K8HLJ	150	11	24	39,6[illegible]
W3HCW	100	22	18	39,6[illegible]
K3EAQ/3	88	20	16	28,1[illegible]
K3SNU	90	14	19	23,9[illegible]
K8GVK/8	106	11	20	22,3[illegible]
WA2BWQ	82	14	19	21,8[illegible]
WA4EBU	60	15	13	11,7[illegible]
K3SHY	51	14	13	9,2[illegible]
K8OLB	65	6	15	5,8[illegible]
W6WBD	64	12	6	4,6[illegible]
K3NBC	43	5	11	2,3[illegible]
W8FY	34	11	6	2,2[illegible]
W4ZZ/4	6	4	1	[illegible]

144 Mc

K2FCO/2	192	36	24	165,8[illegible]
K9HXX	12	6	2	1[illegible]

Multi-Band

Letter groups after call letters indicate the following: A-6, B-2, C-1½, D-¾m. Numbers denote: total number of contacts on all bands, county multiplier, hours multiplier, and final score. *Note:* Multipliers shown do not correspond directly with final score since band totals were scored individually and then combined for final tabulation.

Single Operator

K8UQA	AB	225	32	27	154,1[illegible]
W2FBR	ABC	210	47	23	50,5[illegible]
K9EVA	AB	137	14	19	18,3[illegible]
K5TXX	AB	57	8	16	4,0[illegible]
W9ROS	AB	69	14	13	3,5[illegible]
K9BBN	ABC	78	10	14	2,4[illegible]
WAØBAO	AB	48	14	9	2,1[illegible]
W9DJ	ABC	64	12	12	2,0[illegible]
W8CXS	AB	47	7	10	1,9[illegible]
K9YOA	AB	55	8	7	8[illegible]
W5HXW	AB	35	6	7	5[illegible]
K9UOK	AB	27	9	4	4[illegible]
K9IOA	ABC	32	7	6	3[illegible]
K8DQW	AB	23	7	4	2[illegible]
K7EMO/7	AB	17	14	4	2[illegible]
K9KGI	AB	28	15	4	1[illegible]

Multi Operator

WA2BAH	AB	173	37	31	66,7[illegible]
K6YIL/6	AB	182	32	37	53,7[illegible]
W1ALE	AB	135	28	24	46,2[illegible]
K2ZSQ/2	AB	225	35	20	41,0[illegible]
W3FDH/3	AB	101	41	17	26,3[illegible]
W3JMP/3	AB	95	25	15	24,6[illegible]
K1TLO/1	ABD	118	23	27	15,8[illegible]
K4WVP	AB	76	23	17	7,7[illegible]
K9JGH	AB	47	21	9	6,1[illegible]
W6NLO/6	AB	57	9	15	2,6[illegible]
W7VTW	AB	52	8	9	1,5[illegible]

The Importance of Neutralization

BY DAVID T. GEISER*, WA2ANU

Number 3 of a Series

Ross Hull (*QST*, September 1928, "The Oscillator-Amplifier Transmitter") examined the practical suitability of this basic type of transmitter, and found one of the most important adjustments to be neutralization of the amplifier. In his words, ". . . even in these enlightened days the use of a master-oscillator-amplifier transmitter does not spell the end of swinging and creeping frequencies—that its use does not in any way eliminate the necessity of careful and exact tuning." These words are still true today, for while v.f.o.s and their buffers are better, receiver stabilities show present transmitters to be just as critical.

Hull noticed that the amplifier tuning and loading affected the oscillator frequency—a characteristic of poor neutralization. He did not find a good way of exactly neutralizing an amplifier without all voltages applied, *nor is there one today*. Yet when all voltages are applied, the amplifier amplifies and there is no way of separating the "amplified" signal from the "feed-through" signal. As a result, he combined the "no amplifier plate voltage" method with use of a monitor.

What Is Neutralization?

Neutralization is the elimination of all signal paths from the input to the output of an amplifier except through amplification. Usually this is done by feeding output circuit energy back into the input circuits in a fashion that exactly equals but opposes (and hence cancels) energy otherwise feeding back from output to input.

Why Neutralize?

The obvious present-day answer is to make the amplifier stable—to keep it from oscillating; for what is an oscillator but an amplifier with a feedback path. Hull's reason was more profound—amplifier tuning and loading of an improperly neutralized amplifier reflects an inductance or capacitance back into the circuit driving the amplifier. This detunes the driving circuit. Where Hull was dealing with a self-excited oscillator drive, he saw shifts of 8 kc or so on 40 meters. Today we usually have a buffer (except in "Command" transmitters), but with present receivers, a shift of 80 c.p.s. is annoying and sometimes intolerable. Interestingly enough, this much shift can be obtained by tuning a poorly-neutralized amplifier driven by a crystal oscillator.

What was Hull's neutralizing procedure? He put an r.f. pick-up loop near the final tank (with B+ disconnected) and peaked all tuning circuits for maximum indication. He then adjusted neutralization (C_n in fig. 1) for minimum r.f. pick-up. Again he tuned the final plate for maximum r.f. pick-up, and followed by readjusting C_n. This was repeated until there was no indication for any final tank setting. Then he applied plate power to the amplifier and, listening to the beat note in a well-shielded monitor, loaded the amplifier into a dummy or other load, checking for variations in frequency with load setting. If there was appreciable variation, the neutralizing capacitor setting was delicately adjusted.

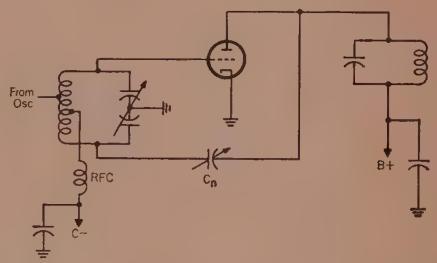


Fig. 1—An example of a typical neutralizing circuit.

The neutralizing adjustment (live amplifier) was speeded by using a power supply with hum for plate power—a procedure legal only with a well-shielded dummy load nowadays. This varying plate voltage created an f.m. beat note (different from a.m. sidebands) in the monitor when a poorly-neutralized amplifier was being tested, and the concluding neutralizing adjustment was made for the most stable beat note in the monitor. This procedure may be varied today by dropping the final voltage with a resistor and then raising it back to normal, checking for minimum shift.

A word of warning: neutralizing capacitors, being connected to plate circuits, quite commonly have high voltage on them. Live neutralization is safe only if there is no possible way for voltage to reach the operator.

(Author's Note: Ross Hull was quite noted in amateur publishing and v.h.f. work in the '20s and '30s. He was electrocuted by an experimental ham TV setup.) ■

*Light Military Electronics Dept., General Electric Co., Utica, N. Y.

HAMS IN THE FAR EAST

BY ARTHUR S. LUKACH*, W2DPP

THIS account of amateur radio in the Far East is based on contacts and observations made by the author on an around-the-world trip during the late fall of 1961. The urge to see the world and rag-chew with hams enroute had already taken me to various countries in Europe. The Far East, however, with its strange sights and exotic settings, has always occupied top place on my schedule of travel. Accordingly, on October 10th, I left the home QTH airbound for San Francisco and thence on to Japan.

I could easily devote this entire report to a description of dynamic, beautiful and vibrant Japan. However, since *CQ* is synonomous with ham radio, and for flying carpet devotees there is always the *National Geographic Magazine,* I will attempt to confine my remarks to the activities of amateur radio in JA land.

Two weeks before I left New York, I had talk at length on 14 mc s.s.b. with Jimj, KA2JL/W4EFB, a chief warrant officer attached to the U. S. Naval Base at Yokohama. At his invitation, the XYL and I took the train from Tokyo and were met at the station by 6'6" Jim and his XYL. The location of his home would make any antenna-minded ham turn green with envy. Situated on one of the highest hills in Yokohama, it commanded an unobstructed view in all directions. Helped by a tall mast and a cubical quod, his 100 watt Apache with a s.s.b. converter really did an outstanding job. However, to use reverse English, every silver lining has a cloud. When the typhoon season starts, the mortality rate among beams is particularly high.

Since Japan today is one of the important producers of electronic equipment, it is only natural that the country, small though it is, should have a large group of active hams. There are about 10,000 amateurs, with almost 10% of them located in the Tokyo area. About 100 are YL's or XYL's. The government issues four classes of licenses. First class telegraph and telephone entitles the licensee to operate all bands, all emissions, with 500 watt output; 2nd class is limited to above 10 meters and below 40, c.w. and phone with a power of 100 watts; 3rd class allows operation on c.w. below 40 meters and is limited to 10 watts; 4th class is for phone with the same restrictions as 3rd class. The country is divided into 10 call areas running from 1 to 0.

The favorite DX band is 20 meters; 40 meters is preferred for domestic traffic and is very crowded. I was able to procure copies of their excellent magazines, *CQ Ham Radio* and *Junior CQ Ham Radio,* both written in Japanese. The first one had about 130 pages and I was told its circulation was almost 20,000. Both magazines differ from *QST* in that they are published by a private firm, but each issue contains a few pages devoted to JARL news.

In company with JA1CR I inspected the Headquarters station JA1RL located on the ground floor of the Tokyo Red Cross Building. Their equipment consisted of a commercially-built 500 watt rig used for c.w. and a.m. emissions, a National Super Pro receiver and a surplus BC 610. Located at the same address is JA1IGY (the IGY standing for International Geophysical Year), which transmits its call letters automatically 24 hours a day on a frequency of 29 and 51 mc. This is done at the request of the IGY committee as an aid in their propagation studies. Two girls and a licensed operator comprised the personnel at the station. The main function of the girls seemed to be the processing of thousands of QSL cards which arrive each month.

Before I left Tokyo, I had a call from JA1ANG, Harry, well-known to many s.s.b. hams in the States. When he said he would meet me in the lobby of my hotel, I asked how I would recognize him. (Incidentally, this question arose many times on my trip.) His solution was simple—he said he would be carrying a copy of *CQ*. As head of the script division of a local TV station, his was the interesting job of putting a Japanese sound track on such well-known programs as "I Love Lucy" and "77 Sunset Strip".

On a parlor car train from Kyoto to Tokyo I thought it interesting to note that each chair had an individual hearing aid type receiver connected to a 2 channel central radio system. Next to this was a jack marked "Phone" into which, upon request, a telephone could be plugged and a call made while the train was in motion.

The time by jet from Tokyo to Hong Kong is about 2½ hours. Because of the scarcity of space for a landing strip, the runway extends into the water and the plane stops about a

*C/o George Backer, Inc., 295 Fifth Ave., New York 16, N.Y.

block from the end. Looking out of the window you have the uncomfortable feeling that if the reversing mechanism failed, you would be taking an unscheduled dip in beautiful Hong Kong harbor. It is this port that makes the city one of the real beauty spots of the world.

A note left at the Peninsula Hotel by George, VS6DS, asked that I phone him to arrange a meeting. Again there arose the question of recognition. This time I hit upon a simple solution. I had noticed that no one in this part of the world wore a hat, so I told him that I would be the only man in Hong Kong with one. The trip started from the Kowloon side with a rickshaw ride to the ferry, then across the harbor to Victoria Island to the place where George, gazing at every man's head, recognized the hat and made a beeline for it. We drove almost to the summit of Hong Kong peak, the location of his attractive apartment. The twinkling harbor lights far below, the dark outlines of modern freighters alongside Chinese junks, and above all a clear starry sky, combined to create an unforgettable picture.

Incidentally, George has the honor of being president of the Hong Kong Radio Transmitting Society and acting head of the Post Office Department. I was delighted when we were joined by Bill, VS1KF, who had just arrived from Singapore. Over many glasses of Holland's famous Heineken beer, we rag chewed until a late hour while the XYL's discussed shopping and clothes. We inspected George's rig, which does a beautiful job with the help of a vertical antenna and 40 watts of a.m.

Hong Kong Ham Fest, seated left to right: VS6EK's XYL, W2DPP, W2DPP's XYL, DU1OR, VS6DK, DU1OR's son, VS6DJ. Standing left to right: VS6DS, VS6EL, VS6EL's XYL, VS6DS's XYL, DL1OV, VS1KF, VS6EK, VS6AE, VS6EC, VS6EM.

There are some 40 licensed hams in Hong Kong, about 20 of whom are active. The popular band is 20 meters with some on 15. About 4 are on s.s.b. Typhoons during the months from May to September create winds up to 100 miles an hour. It was not surprising, therefore, that beam antennas were few and far between. The Hong Kong Radio Transmitting Society publishes a quarterly news letter. License examinations are very thorough and are similar to those given in Great Britain. Most gear is English with lots of modified surplus equipment. TVI is unheard of for a very simple reason—there are no TV stations. However, I noticed in George's apartment a TV receiver which operated from a closed circuit.

About three days later, I was notified that in honor of DU1OR, VS1KF and the writer, a real ham fest had been arranged, starting off with drinks at Drake's apartment VS6EK and followed by an unusual Chinese dinner. After being introduced to Ailune, Drake's charming and talented Chinese XYL, we soon were operating his rig. It consisted of a Central Electronics 10 watt s.s.b. exciter plus a 40 watt linear. VS6BE "Lyle", a pilot for Cathay Pacific Airways was in VK2HX's shack at Sydney, and I was properly introduced to him over the air. After that, the doorbell rang incessantly and before long the following hams and XYL's were in the apartment—Pat VS6AE, Ronnie VS6EL and his XYL, Doc Tan VS6DJ, Bill VS6EM, David VS6DK, George VS6DS and the XYL, Ted VS6EC and the XYL, Inger DL1OV, Bill (from Singapore) VS1KF and Doc Ed DU1OR (from Manila).

An honest-to-goodness radio romance had resulted in the marriage of VS6EC and DL1OV. They had contacted each other on c.w., she from Germany and he from Australia where he was stationed as a member of the Air Force. Inger decided that anyone with a fist as good as his must be quite a fellow. She made the long journey to VK land, and it was a case of love at first sight. Shortly thereafter, skip conditions between Germany and Australia meant nothing to a couple of starry-eyed hams.

The meal that VS6EK's Ailune had ordered at a nearby restaurant proved to be a unique experience. I was told that it was to be a Mongolian Hot Pot Dinner party. Placed at the center of each table was a charcoal stove, hence the name Hot Pot. When paper-thin slices of mutton, kidney, tripe and liver were held by chopsticks and immersed in the stove's boiling water, they cooked thoroughly in a matter of minutes. Ham radio seemed to be forgotten entirely, particularly after several helpings of hot rice wine.

From Bill, VS1KF, who had flown up from Singapore, I was able to obtain a fairly good picture of ham activities in that area. Their

[*Continued on page 83*]

Mongolian Hot Pot Dinner, left to right: VS6DS, VS6EK's XYL, W2DPP.

Independent KWM-2 Receiver Control

BY S/SGT. NICK TAYLOR*, K5YTO

THE prime disadvantage of amateur s.s.b. transceivers such as the KWM-2 is that the transmitter and receiver are locked to exactly the same frequency. At first glance this appears to be an advantage rather than a disadvantage in this day of roundtables and frequency precision, but a closer look will reveal many instances where independent fine tuning of the receiver is desirable. When operating with a group of mobile stations there are always a few stations that cannot stay on frequency. Under heavy QRM it is normal to detune slightly to improve readability and when operating in MARS or traffic nets it is imperative that the transmitter be on frequency but it is often necessary to retune the receiver.

The unit described below will permit independent tuning of the KWM-2 receiver over a range of about 2 kc, involves no modifications to the transceiver and costs only $4.60 if all the parts are purchased new. Connections to the KWM-2 are made by a nine pin plug inserted in the noise blanker power socket J_{24} and a single wire pushed into J_{17}, pin 5.

The 70K-2 p.t.o. used in the KWM-2 and S-Line equipment contains a diode switch, CR_{301}, which in conjunction with C_{308} shifts the p.t.o. frequency about 2.5 kc when changing sidebands. The switching action is obtained by applying either a 200 volt forward bias or 32 volt reverse bias to CR_{301}. If the diode bias is made variable, the p.t.o. may be tuned incrementaly across the 2.5 kc range. The addition of a relay applies this variable bias during receive condition only so that on transmit the p.t.o. will return to the dial frequency. Since the relay is controlled by B plus, no changes are needed when going from fixed to mobile operation. The s.p.s.t. switch S_1, disables the variable bias and returns the p.t.o. to normal transceive operation. The unit may be mounted anywhere, but one of the best methods is to put all of the components in a small mini-box and mounted it on the side of the KWM-2 using existing holes. ■

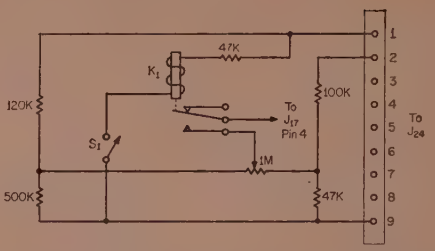


Fig. 1—Simple circuit used to enable tuning the KWM-2 receiver over a 2 kc range. On transmit, the frequency reverts back to the dial setting. The 1 meg pot is a Mallory UA16L and SL3500 shaft with a Mallory US41 switch. The relay, K_1, is a Sigma 11F-2300G/S1L or equivalent.

*Everbreeze Trailer Park, Space L-11, Biloxi, Miss.

More Audio for the Mobile Modulator

BY LAWRENCE M. FRAZIER*, K6SHC

MANY mobile rigs suffer from the same problem, inadequate audio output from the modulator. A simple method of increasing the modulator output without an extensive modification is to regulate the modulator screens.

My mobile rig, using a pair of 6L6s, was modified as shown in fig. 1. With only the series resistor, R_s, the screen voltage would vary under modulation. With no audio, the screen current would be low resulting in a high screen voltage when least needed. Under modulation the screen current would rise thus lowering the screen voltage when most needed.

A simple approach, as mentioned, is series regulation. A pair of NE-51s in series proved to be just right for the 6L6s. The neon bulbs tend to keep the screen voltage very nearly constant over a fairly wide range of screen current. While the average current limit of the neon bulbs is low they are capable high peak currents.

Modulator tubes other than 6L6s require different configurations. Two NE-51s in parallel worked fine for a pair of 6AQ5s operated at 300 volts. For a larger rig, using a pair of 6BQ6s in the modulator, a VR150 did the trick. In an s.s.b. linear with a plate supply of 800 volts we used two VR150s and one VR105, all in series, to hold the screen close to 300 volts. The efficiency improved greatly in all cases. ■

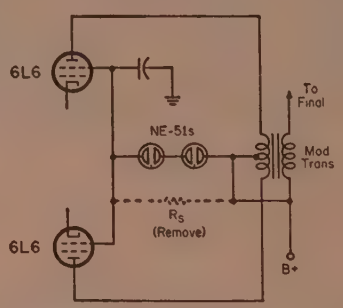


Fig. 1—Substitution of the two NE-51s for R_s results in increased audio output.

*853 Weber Street, Pomona, California.

Electronic Control Devices

ROGER H. TAYLOR*, K9ALD

Some basic data and applications for Varicaps® and zener diodes for use in amateur radio.

A few circuits have appeared in amateur publications using variable parameter devices, such as Varicaps®, zener diodes, etc., in specific applications. However, not much information has been made available on basic design information.

The Varicap is a voltage variable capacitor. The capacitance of these tiny diodes depends on the value of the reverse bias applied to them.

In a reverse biased p.n junction, there is a region in which there are no mobile charge carriers. This "depletion" region acts as a dielectric between two "walls" of charge, which are pulled apart by the bias voltage. These "walls", in effect, are the plates of the capacitor. As the bias voltage is changed, the separation between these two "walls" changes, thus changing the effective capacitance.

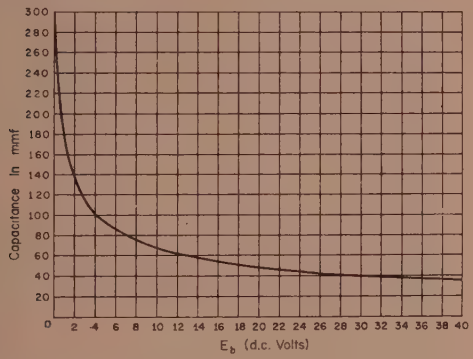


Fig. 1—A plot of Varicap capacitance versus voltage.

The nominal capacitance range is about 7:1, which gives a wide tuning range. Figure 1 is a plot of nominalized capacitance *vs.* bias voltage, for Pacific Semiconductor's Varicap. The capacitance is measured at 50 mc. The Varicap is rated for the value of capacitance at 4 volts reverse bias (100%). Varicaps are usefull all the way into the microwave region. Recently these units have been used as doublers and triplers above 2,000 mc.

Voltage variable capacitors may be substituted in place of mechanically variable capacitors in most cases with the addition of some sort of isolating element such as a choke or resistor. For tuning a receiver, many Varicaps can be tracked from a single potentiometer, thus eliminating mechanical tracking problems. See fig. 2.

Since the capacitance is a function of the instantaneous voltage, the capacitance can vary if the signal is large compared to the bias. In oscillator circuits this sometimes happens as does rectification of the signal. Under high signal level conditions a low impedance path (less than 1K) should be provided for the d.c. return to ground. Because of their fast response, these capacitors can be used as high frequency, frequency changing elements, i.e., modulators. Figure 3 is a typical oscillator with frequency modulation added. The Varicap has been used in similar circuits for pulse work on f.m. and p.m. as well as audio with considerable success.

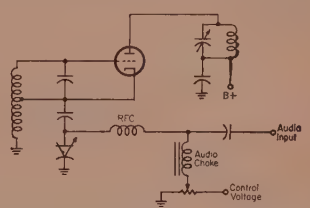


Fig. 3—A circuit showing how a Varicap may be used to produce frequency modulation.

Above 5 volts, the Varicap is fairly stable with temperature changes. For most amateur applications, their stability will suffice. The capacitance change with temperature can be compensated by connecting a similar diode back to back with the capacitor. See fig. 4. Varicaps may be obtained in ranges from the V-7 (3-18mmf.) to the V-100 (57-260mmf.)

Zener Diodes

To obtain a stable d.c. voltage for the capacitors, another semiconductor device, the Zener diode may be used. Most semiconductor diodes

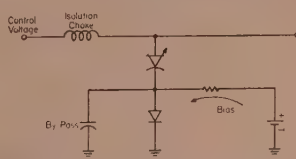


Fig. 4—A simple circuit that can provide temperature stability for a Varicap.

*8105 Crawfordsville Rd., Indianapolis, Ind.

®Registered trademark of the Pacific Semiconductor Co.

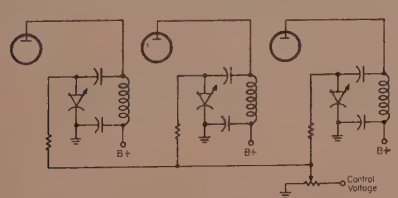


Fig. 2—A circuit showing three stages tuned by Varicaps and a single pot. This eliminates mechanical ganging problems.

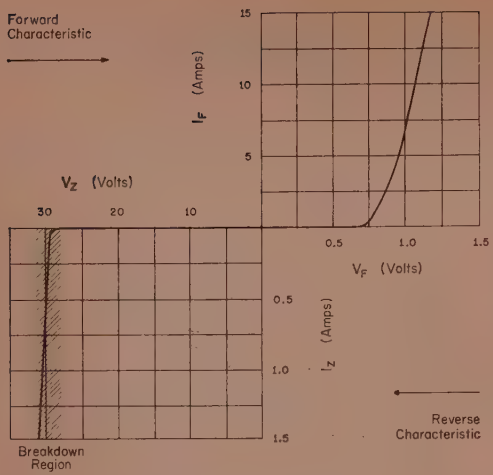


Fig. 5—Curve showing zener characteristics of voltage versus current.

will break down when the reverse voltage exceeds a certain amount. In this region (See fig. 5) a small increase in voltage causes a large increase in current. In other words, a large change is in current through the diode has little effect on the voltage across the diode, thus a regulating device.

Zener diodes are built to accentuate the break down characteristics, and to hold the voltage change within very narrow limits. Zener diodes will handle large current ranges and thus make

Fig. 6—A simple zener regulator circuit.

excellent regulators. In fig. 6, +105 volts is obtained from an unregulated +150 volt supply. A 105 volt 1.5 watt zener will hold its voltage within a 1 ma to 11 ma range in current. If the maximum load current is 20 ma, and the minimum zener current is 1 ma, the resistor must drop 45 volts at 21 ma. Resistor $R_1 = 45/.021 =$ 2180 ohms or 2.2K. When the load current drops to 10 ma, the zener will draw enough current (within its ratings) to drop the voltage to 105 volts, in this case 11 ma.

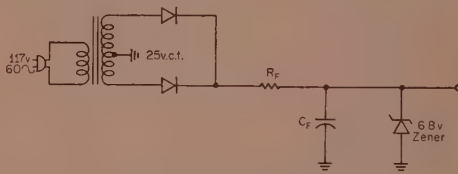


Fig. 7—A zener diode may also be used as a shunt regulator to reduce ripple voltage.

Zener diodes may also be used as filter elements. Since they have a certain nominal d.c. resistance, and a very small a.c. impedance, they work well as a shunt regulator to reduce the a.c. ripple voltage. See fig. 7. ■

CQ Reviews:

The Amplidyne C-61 50 Mc Converter

THE Amplidyne Labs Model C-61 50 mc Converter is a low-cost crystal-controlled unit of simple circuitry providing performance approaching that of many more elaborate models.

Good sensitivity with ample gain, an adequately-low noise figure with a minimum of overloading and cross-modulation are assured through the use of a 6CW4 Nuvistor r.f. amplifier operating in a grounded-grid circuit, and a 6BK7 (or 6BQ7) dual triode mixer-oscillator. Three tuned circuits are used at 50 mc. In addition, a 6C4 triode i.f. amplifier is included, tuned to cover the output frequency range of 14 to 18 mc. Since this stage follows the mixer, the overall gain of the converter is raised without affecting the anti-overload and cross-modulation characteristics. The gain of the i.f. amplifier is adjustable over a 10 db range, making it possible to optimize the output level for use with a wide variety of receivers without overloading while at the same time maintaining the best signal-to-noise ratio. A typical third overtone crystal-controlled oscillator is used with one half of the 6BK7.

The manufacturer's rating for noise figure is 3 db maximum. The model which was checked met this specification over a narrow frequency range near 51 mc. Either side of this frequency the noise figure rose somewhat higher, but was still adequately low for use under most generally encountered conditions.

Bandpass characteristics were good over the lower end of the 50 mc band, but the gain dropped off towards the upper end; however, this should be of little concern, since most operation

[*Continued on page 86*]

Manufactured by Amplidyne Labs, Box 637, Kings Park, N.Y., the C61 converter uses a 6CW4 Nuvistor r.f. amplifier to provide a 3 db noise figure at 6 meters. Input is at the right. The 14-18 mc i.f. amplifier is in the foreground with the i.f. gain control to its right. Chassis size is 2 × 4 × 6 inches.

A Simple Regulated Cathode Bias Source

BY PAUL H. LEE*, W3JHR

THE "Big Brother" 4-1000A linear amplifier described in *CQ* for September 1960 has been a constant source of pleasurable operating ever since it was first put in service two years ago.[1] I can truthfully say that no other amplifier has been so trouble-free for me or has put out such a clean signal. I currently hear many stations using 4-1000A linears, and perhaps the original article started many other amateurs down this same road. I recently made a small change which will be of interest, not only to proud owners of 4-1000A's, but also to others who may need a source of low voltage, regulated, for bias.

Idling Current

One of the beauties of the 4-1000A operating with grid and screen tied together and grounded is that it requires no screen supply nor bias supply. However, acquisition of two brand new tubes, and their resulting use, gave me an idling plate current of over 120 milliamperes at 5000 volts plate voltage. Thus, over 600 watts of useless heat was being dissipated in the top of my cabinet, and all components were running hot. I decided to bias the tube with about 10 volts, in order to cut down the idling current. The curves supplied by Eimac in 1960 showed that this voltage would be a reasonable value for bias. Where to get a 10 volt supply was the next question.

Someone suggested the use of a small transformer and silicon rectifiers. Study showed that to obtain good regulation with 100 milliamperes peak grid current I should be prepared to run about 300 milliamperes through a bleeder across such a supply. This idea did not appeal to me. Then another helpful friend suggested the use of a 2D21 gas tube as a voltage regulator across such a supply. I was doubtful of the ability of one 2D21 to carry grid current peaks, however.

Mercury Vapor Tubes

The thought then hit me, "Why not use a mercury vapor rectifier as a regulator tube?" Carrying the thinking process further, I reasoned that such a tube, with sufficient current carrying capacity, could act as a source of *regulated cathode bias,* under conditions of varying current through it. All that remained was to try the idea. A visit to the surplus tube shelf in the basement brought forth some extra 872A's and a socket. A 5 volt filament transformer from a local dealer's shelf completed the scheme.

The 872A is used as a source of cathode bias, just as one would use a cathode resistor in an audio amplifier stage. The only difference is that the drop across the 872A remains absolutely constant regardless of the instantaneous plate and gridcurrent flowing through it. The exact value of the drop will depend on the age of the tube. Those used for four years in my rectifier show a drop of about 13 volts. A new one shows a drop of 10 volts. This makes a difference of some 20 milliamperes in the idling plate current. With a 13 volt 872A in the circuit, the idling plate current is reduced to 60 milliamperes with a plate voltage of 5000 volts. I probably could have used a pair of 866A's, or a pair of 83's, with all plates in parallel, to carry the peak plate and grid current. However, the 872A and socket were on hand, and it was a matter of keeping the cost down. The RCA Tube Handbook shows a drop of 15 volts as standard for 866A's and 83's. This would of course reduce the idling current even further. For those of you who do not need the peak current capacity of an 872A, the smaller tubes would be perfectly fine for a source of about 15 volts of cathode bias, *regulated.*

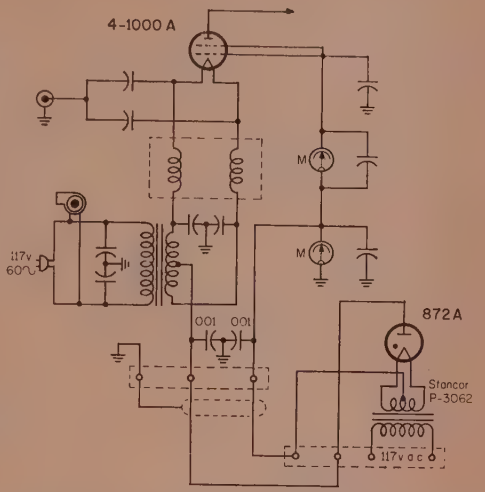


Fig. 1—The 872A voltage drop is used to provide a regulated bias for the 4-1000A. Other gaseous rectifiers may be used in various combinations for other tubes.

The 872A and filament transformer are mounted on a small chassis cut from some scrap aluminum, which is located in the bottom of the cabinet. The only change required in the 4-1000A linear is to break the lead to the center tap of the filament transformer secondary, and to bring the two leads thus created out to a small terminal strip on the rear edge of the chassis. Each lead is bypassed to ground with 0.001 mf mica capacitors, 2,500 volt rating. A shielded two-wire cable runs down to the 872A chassis terminal strip. The primary of the 872 filament transformer is connected to the same source as the 4-1000A filament transformer, so that they come on concurrently. ■

*5209 Bangor Drive, Kensington, Maryland.

[1]Lee, P.H., "The Big Brother Linear," *CQ*, Sept. 1960.

Say Buddy!
You say you left the top down on your convertible,
And it rained in on your KWM-2;
And two hams running kilowatts just moved in across the street;
And three of your harmonics just got their Novice tickets,
And you can't get near the rig now;
And somebody just tossed a rock through your window . . .
With a TVI complaint attached!
Is that what's troubling you?

Hey Mac!
You say some local hams as a joke stuck an ad in *CQ*,
And it said you were selling a 75A-4 for $200,
And the phone hasn't stopped ringing all day;
And one of your jr. ops used your log as a coloring book,
And he thought your s.s.b. rig looked a little drab,

THE HAM'S LAMENT

HOWARD FRUCHTER*, WA2DCM

So he painted it red, orange, and green;
And you were accidentally calling CQ during a CONELRAD[1] test,
And your neighbors heard you on their radios,
And now they're calling you a threat to national security
And they won't let their kids play with yours,
And that ham you promised to QSL but didn't!
You say he just came over and punched you in the nose . . .
Is that what ails you?

Say Cousin!
You say you have a business convention on the weekend of the big contest;
And you just got your order of QSL cards, a thousand of them, multi-color,
And your call is printed wrong on every one of them;
And you were kidding a local about not keeping a log,
And he reported you to the FCC,
And an inspector is in your shack now,
And you can't find your log;
And that W3 who you told in no uncertain terms to QSY from your frequency,
Well, you met him today,
He's your company's biggest client,
And when he heard your call he canceled a quarter million dollar order,
And you just got fired,
Is that what's bothering you?

Hey Bub!
You say a would-be ham just rang your doorbell,
And he wants you to give him his Novice test,
And your working a DX contest;
And you just moved into a new QTH,
And now you have to start all over on all those awards;
And the telephone man cut your coax by accident;
And you accidentally plugged a 2 meter crystal in your 6 meter rig,
And you just called CQ on 48.2 mc, the local police frequency,
And four squad cars just pulled up in front of your house,
And the officers inside are drawing their guns,
Is that what's disturbing you,

Hey You!
You say those QSL cards you sent in for WAZ got lost in the mail,
Yup, all 40 of them!
And a pair of 4CX1000As in your California Kilowatt just went on you,
And you have to replace them at 150 bux apiece;
And your neighbor just discovered that your 100 foot tower is on his property,
And he's making you move it;
And that hidden transmitter hunt lead you to an Air Force Missile Base,
And you're going to be shot in the morning as a spy;
Is that what's making you quiver?

You Again!
You say you and the XYL were having a little spat in your shack,
And her voice tripped the VOX,
And you just got a pink ticket from the FCC for obscene language;
And you were fixing the rig,
And you didn't see that open bleeder,
So you just got 3000 volts across your fingers;
And you had your modulator half apart before that station you were working admitted he was just kidding you about your audio being lousy;
And that new state you worked on 220 turned out to be a bootlegger;
And that DX ham you invited to stay at your house when he was in the states,
He just arrived with his XYL and 6 kids;
Is that why you're crying?

Say, Hard-Luck!
You say your XYL tossed some papers into the garbage,
And it was that article you just finished writing up for *CQ*;
And the FCC just asked you down for a retest of your code copying ability,
And you haven't been on c.w. in 4 years;

[*Continued on page 88*]

*New York University, Loew Hall, 419A, Bronx, N. Y.
[1]Historians believe this term was once used by radio amateurs; however no actual fact can be found to substantiate this remark.—*Editor*

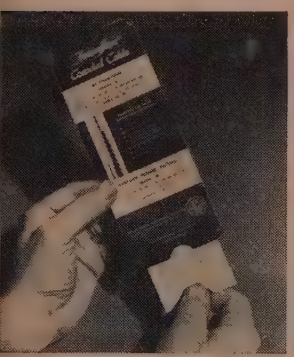
New Amateur Products

Drilling Guides

THE "home-brew" artist will appreciate the new tool introduced by Ethical Enterprises, Inc. of Somerville, N. J. The "Little Jiggers," as they are dubbed, are drilling guides designed to facilitate drilling and tapping holes in the ends of round and hex-shaped rods. The proper size guide is slipped over the end of the rod to be drilled and drilling is accomplished through a guide hole. To tap the drilled hole another guide is installed and again, tapping is accomplished through the guide hole. Four sets are available covering many popular rod sizes. For further information circle A on page 110.

40 & 75 M Rotatable Dipoles

APTLY named the "Cliff-Dweller," this new rotatable, remotely-tuned series of dipoles by New-Tronics is designed to allow 40 and 75 meter operation without the proverbial antenna farm. Separate models for each band and a combination model are available all providing s.w.r.'s of 1.1 : 1 or less across the band with 52 ohm input. The dipoles are tuned by varying the overall lengths through motor-driven end sections, the motor and gear train being enclosed in a cast aluminum housing. A 1¾" diameter pipe may be threaded into the center section to support and rotate the "Cliff-Dweller." For further information, circle B on page 110.

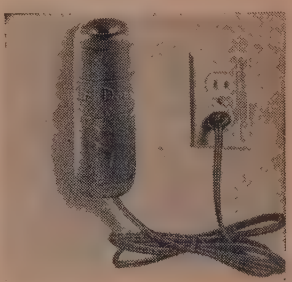


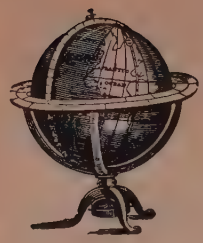
Coax Calculator

A FREE slide rule offering quick reference for calculating the performance and physical specifications of Foamflex coaxial cable is now available from Phelps Dodge Electronic Products Corporation. The slide rule provides information on attenuation (including frequency and decibels) average power rating (in kilowatts) vs. frequency, physical dimensions of inner and outer conductors, weights, minimum bending radius, plus a variety of other helpful data. To receive this helpful gadget write to Phelps Dodge Electronic Products Corp., P.O. Box 187, 60 Dodge Ave., North Haven, Conn. or circle C on page 110.

Air-Dri Dehumidifier

DAMPNESS and mildew are arch enemies of most electronic equipment; hence the appeal of this item. The Air-Dri is a 25 watt electric heater shaped in such a way as to dry large quantities of air by convection. A volume of 160 cubic feet can be maintained at a relative humidity of less than 70. The Underwriters approved device is priced at $7.95 and costs only a few cents per month to operate. For further information, circle D on page 110.





DX DX DX DX DX

URBAN LE JEUNE, JR.*, W2DEC

The following certificates were issued between the period from December 6th, 1962 to and including January 15, 1963:

CW/PHONE WAZ

1757	W4RVW	W. W. Baldwin
1758	VE3DKY	Jeanne Robinson
1759	VE3ES	Jack McLeod
1760	W6LGZ	Harry A. Bailey
1761	W9OD	Anthony Martinka
1762	UA4HC	C. Kraschin
1763	UB5MZ	Edward Zilberman
1764	UD6AM	F. Muradjan
1765	UAØGF	John Glushin
1766	WA2SFP	James L. Lawson
1767	HA5KAG	Radio Club of Orion
1768	K5OGP	Erik A. Jensen
1769	WØYTQ	Heinz H. Blankenhagen
1770	DL3JE	Willi Assold
1771	W6ZMW	Curtis H. Roche
1772	K7ADL	Bill Bevan
1773	DL1ES	Paul Maisel
1774	W8QNW	John W. Govier

ALL PHONE WAZ

185	W8KIA	Glenn R. Thayer
186	WA2SFP	James L. Lawson
187	W6RKP	James N. Chavarria
188	VE7CE	R. J. M. Gauvreau
189	GI6TK	Frank A. Robb

TWO-WAY SSB

142	W7CMO	Norman S. Moberg
143	LA5LG	Per Gunderson
144	WA2SFP	James L. Lawson
145	W6RKP	James N. Chavarria
146	GI6TK	Frank A. Robb
147	W1BHP	C. Stanley Knight

WPX

CW WPX

404	UA3HI	Boris Denischuk
405	UA1AI	G. A. Iarowenko
406	UA9CL	Alex Blohincev
407	UA2KAA	Radio Club of Kaliningrad
408	UA3AN	Vladimir Makarow
409	YO8CF	Iacob Ioan
410	SP9ADU	Andrzej Pelczar
411	YO2BU	Dan Constantin
412	F9RS	Charles Saniez

MIXED WPX

53	KP4AOO	Roger J. Burt
54	W6WX	David P. Baker

PHONE WPX

82	W1ZSU	Anthony J. Iacobucci
83	DL9OH	Karl Muller

THE West Gulf DX Club polls its members once a year to determine what are the most needed and wanted countries and the top 35 candidates are presented below. The percentage of DXers requesting them is also shown. This list should be a good guide to those planning an expedition.

Last year's number one choice, TR8, is number 88 this year. Number 9 last year, Aldabra, didn't even qualify for listing this year. Will 1963 bring such dramatic changes? Let's hope so.

Prefix	*Percent*	*Prefix*	*Percent*
FB8-Tromelin	79	VP8-S. Sandwich	41
AC3	78	C	40
AC4	77	VK9/ZC3	38
VK4-Willis	68	YI	35
4W1	66	Cambodia	34
VKØ-Heard	63	EA9-Rio de Oro	32
VQ8-Rodriguez	50	KG6-Mariana	31
ZA	50	PK5	30
C9	44	VQ8-Cargados	30
FB8-Comoro	43	YA	30
AC5	42	VK9-Cocos	29
JY	41	VK9-Nauru	27
VU4	27	VS5	21
ZL-Kermadec	27	KC4-Navassa	20
PK6	26	CR5-P. Guinea	19
EA9-Ifni	26	PK4	19
PK1, 2, 3	24	TA	19
9N1	23		

*Box 35, Hazlet, New Jersey.

AC5 Bhutan: AC5SQ (ex-AC3SQ) is active from time to time around 1200 to 1230 GMT. His frequency is 14075. (*Tnx WGDXC*).

CEØX San Felix Islands: An expedition to this spot, which will be a new country, will take place in April. Operating roster includes W4DQS, W4CKB, W4QVJ, W6HAW, W8FGX, W9EVI, HK1QQ, HK3LX and possibly CE3AG and another CE ham. With a group like this, they can't miss. I guess the worst thing which could happen is that they would put Mac, W9EVI, at a c.w. position. The call of CEØXA has been assigned and all transportation secured. Look for another outstanding performance. (*Tnx* Fla. DX Report).

ET3 Ethiopia: Two members of the Western Penn. DX Society are currently active in Ethiopia. They are Jack, ET3JK and Frank, ET3FW.

WPX HONOR ROLL

C.W. WPX

W2HMJ	668
W8KPL	632
W5KC	619
W2AIW	598
W6KG	574
W2EQS	572
K6CQM	565
W5OLG	564
W2NUT	550
W4OPM	549
W9YSX	544
W9UXO	542
K2UKQ	535
W2HO	526
DL1QT	518
K9AGB	515
W1IJB	513
W1EQ	512
W6WO	511
W2GT	510
SM7MS	510
W8LY	506
W9DWQ	506
W9GFF	503
G3EYN	503
YU1AG	503
W5LGG	502
W6YY	502
IT1AGA	502
K2CPR	501
W9SFR	501
K7ZKU	500
W2EMW	500
G2GM	499
W2MUM	495
W1WLW	494
SM5CCE	488
W4BYU	487
ON4QX	486
W8PQQ	481
W4HYW	478
W3OCU	466
K6SXA	464
W2KIR	463
DJ2KS	462
PY4OD	462
JA2JW	461
W9WCE	458
W8IBX	416
WØMCX	416
K2PFC	415
W5AWT	412
W5DA	412
WA2DIG	411
K5LZO	411
W2PTD	411
W4DKP	410
W1CKU	408
K4JVE	407
W5AFX	407
W7HDL	405
W4YWX	404
GI3OQR	404
ZS4MG	404
W3AYD	420
W9UZC	418
W3AYD	443
OE1FF	442
LA5HE	437
W3BQA	437
W8UMR	429
WØAUB	429
W2RA	428
K5LIA	428
OK1MB	428
W3CGS	426
W1EIO	425
SM5WI	424
WØVBQ	401
W9PGI	420
HB9TT	419
OK3EA	419
W3BCY	457
DL3RK	454
K9EAB	451
PAØLOU	451
W3PGB	450
DL1YA	450
DL9KP	450
W8JIN	449
W9UZS	447
W8RQ	445
W3AYD	443
OE1FF	442
LA5HE	437
W7HDL	405
W4YWX	404
G8KS	430
VK6RU	421
W3AYD	420
W9UZC	418
F8PI	418
PZ1AX	413
K2CJN	409
DL3TJ	404
W1UOP	402
G3NUG	400
OE1FF	382
SP7HX	381
VE1AE	400
VE4OX	400
VK3KB	400

Phone WPX

CT1PK	587
G3DO	565
W9WHM	562
W8WT	562
W9YSQ	471
MP4BBW	454
PAØHBO	453
W6YY	448
G8KS	430
VK6RU	421
W3AYD	420
W9UZC	418
F8PI	418
PZ1AX	413
K2CJN	409
DL3TJ	404
W1UOP	402
G3NUG	400
OE1FF	382
SP7HX	381
TG9AD	381
DL6VM	376
PAØSNG	369
K9EAB	366
G3FKM	366
W8UMR	363
SM3EP	361
W5ERY	358
W8JIN	356
PY2CK	354
5A5TO	353
W1ORV	351
LA5HE	351

S.S.B. WPX

MP4BBW	462
W4OPM	451
G3AWZ	428
HB9TL	423
W3NKM	402
G8KS	400
G3DO	367
G3NUG	356
TI2HP	356
W3MAC	354
K9EAB	350
PZ1AX	345
W2HXG	324
W2VCZ	320
W2YBO	318
W8PQQ	315
W1ORV	307
K4PUS	305
W6YMV	304
K1IXG	303
K2TDI	300
WA2SFP	300
KØRDP	300
WØCVU	291
W1VOP	273
K2JFV	266
K2MGE	263
W3AYD	262
W4EEU	262
W4NJF	260
DJ3CP	260
VE3BKL	259
W3VSU	256
XE1CV	256
G3FKM	255
UR2AR	255
TG9AD	252
W4RLS	251

MIXED WPX

W8JIN	605
G3DO	597
W4OPM	595
W3OCU	588
W8WT	584
W6YY	570
W4BYU	557
K9EAB	553
W3AYD	552
HB9EU	551
YU1AG	533
W2GT	528
G8KS	520
W5LGG	509
W9DWQ	508
K2ZKU	508
W3KDP	501
W8UMR	500
LA5HE	500

Present activity is on 7 and 14 mc, c.w. and s.s.b. at approximately 1500 to 2000 GMT Monday thru Friday, various times on Saturday and Sunday. QSL manager is Ken, K3HQJ. Usual s.a.s.e. and IRCs for foreign direct reply. *(Tnx K3HQJ).*

EP Iran: Dick Cormier, ex-ET2US/ET2 and ET3AC writes from EP2 land that he expects to be licensed and operating from Iran soon. Probably 20 c.w. to start with. Any QSL cards for his operations as ET2US/ET2 and ET3AC in Eritrea, Ethiopia, can be had via his home call K1KOM or to him at APO 205, N. Y., N. Y. He expects to be there at least two years and glad to hear from all his friends on 20 c.w.

FB8WW Crozet Island: As this is being written (end of January) the scheduled activity of FB8WW has not taken place. A station signing FB8WW was worked by W8JIN, W3JNN and others but this is more than likely a phony. The transmitter that is there at present will not tune 20 meters but this could, of course, be modified. Frequencies will be 7006, 7040 and 7073 or multiples of these. QSLs will go to 5R8BC.

FM7 Martinique: Pierre, FM7WQ, is active most evenings after 2200 GMT on 14314 and 14304 (14142 and 14125 for DX). Because of his work schedule he is unable to observe any regular operating hours. *(Tnx W4OPM).*

DM3RBM trying to snag a rare one. Ludwig is an engineer in Leipzig. *(Tnx K2UKQ).*

HS1 Siam: Phil, W4LCY, after almost two log books from his /KM6 operation, is now in HS land trying to get on the air. *(Tnx* FDXR*).*

KG6 Marcus Island: Ray, KH6PD/KG6, is now active on 20 s.s.b. from Marcus Island. He is very active Monday thru Friday on 14295 between 1900 and 2100 GMT. On weekends he will remain on until 2400 GMT to accommodate the East Coast. Ray expects to remain on Marcus for at least six more months and promises to remove it from the rare list. Bob, W2VCZ, has agreed to handle the QSL chores for both stateside and foreign with s.a.s.e. a must. Logs will be air mailed every two weeks and Bob has 1000 QSLs printed and ready to go. QSL via W2VCZ, 30 Pitcairn Avenue, Ho-Ho-Kus, New Jersey *(Tnx WGDXC).*

LA/P Spitzbergen: Finn, LA5I/P, is active daily on 14340 s.s.b. at 1300 GMT. *(Tnx WGDXC).*

LX Luxemburg: DJØIR will be operating as LX3IR in March. Don informs me he will operate 15 and 20 meters both c.w. and phone. He will also operate as PX1IR during March.

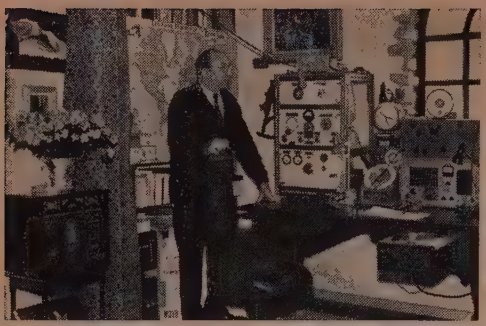
TL8 Central African Republic: TL8AC has returned to CAR from leave in France. Pierre is active on 14 and 21 mc c.w. phone. QSLs via W8KML. *(Tnx WGDXC).*

TT8 Chad Republic: Yves, TT8AJ, has moved

WAZ and WPX

THE WAZ and WPX certificates are awarded by the *CQ* DX department. WAZ is issued for proof of contact with the 40 Zones of the world as shown on the official WAZ Zone Map. WAZ is issued in three classes, *i.e.* Any mode, all phone and all s.s.b. For complete rules, see the January, 1962 *CQ*, page 50.

WPX is issued in four classes, *i.e.*, all c.w., all phone, all s.s.b. and Mixed. The number of prefixes required are: C.W.-300: Phone-300; s.s.b.-200; Mixed-400. For complete rules, see January, 1962 *CQ*, page 52. WAZ applications, Zone Maps and WPX applications may be obtained from the DX Editor at the address shown at the head of this column. Please send a self-addressed, stamped envelope or a self-addressed envelope and an IRC. All applications should be sent directly to the DX Editor.



The inside and outside of the F2GO "shack". Roger is shown at the operating position. *(Tnx K2UKQ).*

from Largeau to Ft. Lamy. He is building a 200 watt c.w.-fone rig as well as a 21 mc converter for his BC-348 and expects to be much more active than he has been in the past. Bill, K2UYG, has received all Yves' logs thru 10 June '62 and expects to receive the others shortly. Bill also learns that TT8AA and TT8AC are active from Ft. Lamy on a.m. fone while TT8AL is active on c.w., on 20 and 15. *(Tnx K2UYG).*

VK9 Christmas Island: From VK4CC via the West Gulf DX Club, we learn that VK9XO was an unlicensed station.

VS9M Maldive Islands: There are two operators, Brian and Colin, operating at VS9MB. They are on the air daily on s.s.b. on 14110, 14280, 14294 kc. They are workable from about 1330 to 1530 GMT. Long Path. Signals are rather weak, however. They are also active weekends on 21 mc. *(Tnx LIDXA).*

YK1 Syria: YK1AK has been active lately on 14 mc c.w. His name is Talha and 14050 is preferred. *(Tnx VERON).*

ZD8 Ascension Island: The following letter from Ralph, ex-VP5RH/VP7BP, speaks for itself:

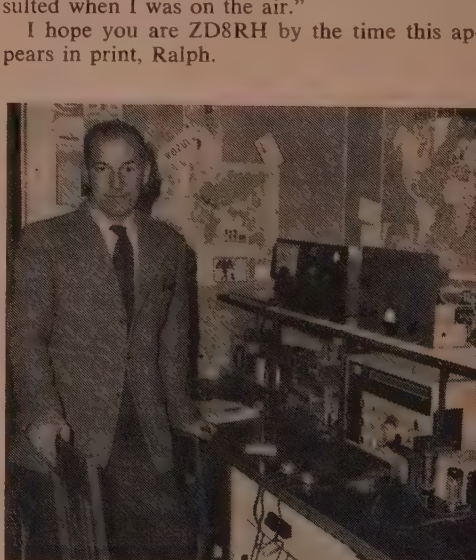
"First of all, I have been operating from October 1960 to October 1962 from the Island of San Salvador in the Bahamas under the call of VP7BP. I have now gone QRT due to a transfer to my present location of Ascension Island, or ZD8 land. Anyone that has contacted me under VP7BP may obtain a QSL card via W2CTN who has plenty of cards and my complete logs for my 6000 QSO's or more.

"Next item of interest is that chances look good that I may soon be getting a license for operation from Ascension Island. The final granting of the license lies in the hands of the Governor who is on St. Helena Island, but to date I have in writing from London that no objection exists there to my being licensed here and a telegram has been sent to the Governor to this effect. Although nothing is a certainty at this point, the chances do look very good toward my receiving a license.

"If I should get this ZD8 call I would like to go on the air using both s.s.b. and c.w. My main operation will probably be on 20 and 15 as this is where I can hear the most activity on my Drake 2B, but I have heard stateside activity on c.w. from 40 to 15 and s.s.b. on both 15 and 20. I will be in the market for a good used KWM-2 with the portable power supply, carrying case and station control along with a noise blanker as the local QRN is sometimes bad. I am looking for the best price I can get on the used equipment as I can't really afford it . . . if I go on the air I'd like to have this equipment . . . wanting to be able to give as many of the hams I can during my next year or two here a chance to get this possibly new country for them and one that has been on the rare side. Jack, W2CTN, has told me it would be ok for any offers to be sent to him and he will relay the best offers to me.

"I have been privileged over the past three years to have the experience of being DX from San Salvador, Bahamas and Grand Turk Island West Indies under the call of VP5RH, but I also have gotten a look at the other side of the picture. I find that this isn't very easy at times but can be enjoyable as most hams are courteous and understanding and it is only a few that have caused me grief with their obsession to work that new one. I have worked both c.w. and s.s.b and find s.s.b. most enjoyable as I can once in a while get in the rag-chews I like, in between trying to handle the many pile-ups that have resulted when I was on the air."

I hope you are ZD8RH by the time this appears in print, Ralph.



Carl, SM6CJI, and his neat rig. It doesn't look like Ca has TVI troubles. YET! *(Tnx K2UKQ).*

Alec and his station VP5AH in Kingstown, Jamaica. Alec runs 40 watts to a TA33 Jr. thirty feet high a DX 35 and a home-brew modulator furnish the power and the receiver is a Hallicrafters S40-A. VP5AH can be heard on 15 meters every weekend the band is open. and in the afternoons during the summer when the days are longer and the band is open after working hours. He is still working on his WAS and needs Del., N. Mex., Idaho, Nev., Mont., Ore., Mo., North and South Dak., KL7, KH6. He is also a DX hound and is after the DXCC and recently has become a Certificate Hunter. *(Tnx K4UFE).*

ZS2MI Marion Island: Jack, ZS1OU, will be going to Marion Island, ZS2MI, if he can arrange for leave. If plans work out he will be active from ZS2MI during Apr. 1. *(Tnx WGDXC).*

4W1 Yemen: "I am sorry to inform you that there is no OK1PX license, it has never been issued. The only PX licensed here is OK3PX, who has never been in Yemen. He is not even interested in DX. I have written to the Central Radio Club and they know about 4W1AA."

4X4 Israel: I'm sorry to report that 4X4MX is now a Silent Key. His brother, Isaac, 4X4FU, informs me that he fell in action while serving in the army.

5V4 Dahomey: Mac, 5N2SMW, will make a DXpedition to Dahomey if the loan of a small portable rig could be arranged. *(Tnx WGDXC).*

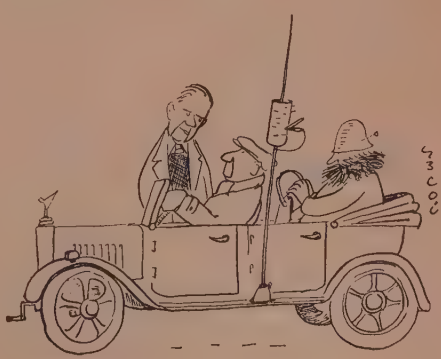
9G1 Ghana: George, 9G1DT (W3OVA) will return to the states in June. He will bring all logs and will gladly QSL any requests. He will be replaced by Ned 9G1EF and W4HQE will continue on as Ned's manager.

I was sorry to hear that two well-known DXers were in the hospital recently. To Vlad, UA1CK, and Vince, W5KC, I wish a speedy and complete recovery.

QTH's and QSL Managers

AP5DC	John J. Geil, Technical Training Center, City Rosol Ramma, Dacca 2, East Pakistan.
DJØIR	Don Simonsen, Parkstr 47, bei Bressler, 35 Kassel, Germany or via K7BVZ.
DJØIRA	Don Simonsen, Burgstr 266 bei Plail, Felsberg, Bez, Kassel Germany or via K7BVZ.
ET3F6W	via K3HQJ.
ET3JK	via K3HQJ.
ET3RS	APO 205, New York, N. Y.
ET3USN	APO 843, c/o PM, New York, N. Y.
FG7XT	via K5AWR.
HH2J	Joseph Salgado, POB 405, Porte a Prince, Haiti.
HKØZU	via W4BJ.
HM5BF	via Helen Dynes, POB 840, Corpus Christi, Texas.
HM5BG	via Helen Dynes, POB 840, Corpus Christi, Texas.
JA5FQ	via WA6PMK.
KC6BO	Dave, Koror, Western Carolines.
KH6PD/KG6	(Marcus Is) via W2VCZ.
LU8XH	via LU4DHR.
OA5W	Box 1229, Lima, Peru.
SM5CBE/9Q5	via SM Bureau.
TL8AC	via W8KML.
TU2AK	Box 1813 Abidjan, Cote d'Ivoirs.
VK9ZS	via ZS6LM.
VP2LS	via K8ONV.
VP2ML	via K8ONV.
VP2SH	Rudy Nelson, Dept. Agriculture, Kingstown, St. Vincent, W.I.
VP5RH	via ZD8RH.
VP6LJ	via W2CTN.
VP7BP	via W2CTN.
VP8AI	via W2GTN.
VP8HD	via G3PEK.
ex-VR1B	A. Charles Hawker, POB 35, Dimboola, Vic. Australia.
VR2EK	William J. Erich, Denba, Fiji Islands.
VS9ACH	Box 1158, Aden.
W2GLM/KW6	via WA2RAU.
YN3KM	via K1KDP.
ZA1KFF	Box 77, Tirana, Albania.
ZD3P	via G2BVN.
ZD8RH	Ralph Hyland, Ascension AAFB, c/o GMRD, POB 4187, Patrick AFB, Fla.
ZS6PC/9	Box 9321, Johannesburg, S. Africa.
4X4DH	via W5VSQ.
GW3PSM ex-5B4CT/ G3PSM/ VS9A/ ZC4CT	Colin J. Thomas, 59 Maendy Way, W. Pointnewdd, Cumbran, Monmouthshire, South Wales, U. K.
5U7AH	Jacques, c/o PTT, Niamey, Niger Rep.
6Q1WF	Box 6, Mogadiscio, Somali Rep.
6W8DE	P. O. Box 3033, Dakar, Senegal.
9G1EF	via W4HUE.
9L1HB	Box 7, Freetown, Sierra Leone.
9L1RO	Ron Oxley Pepel, Freetown, Sierra Leone.
9Q5RK	via LX1RK.
9U5DR	Dave Riley, Kwisumo, Ruyigi, Burrundi, Africa.
ex-9U5KU	James E. Morris, 15019 Hilliard Rd., Lakewood 7, Ohio.

73, Urb, W2DEC



"Is she fully surpressed?"

CONTEST CALENDAR

FRANK ANZALONE*, W1WY

CALENDAR OF EVENTS

March	2-3	YL/OM Phone
March	9-10	No. Dakota Party
March	9-11	ARRL DX Phone
March	16	*VHF Amateur*
March	16-17	YL/OM C.W.
March	23-25	ARRL DX C.W.
March	23	APDX (Pakistan)
March	30-31	*CQ* W.W. SSB DX
March	30-31	REF C.W.
March	30-31	West Virginia Party
April	6-7	Helvetia 22
April	6-7	PZK DX C.W.
April	10-11	YL v.h.f.
April	20-21	REF Phone
April	20-21	PZK DX Phone
April	27-28	PACC C.W.
May	4-5	PACC Phone
May	4-5	*CQ* W.W. v.h.f.
May	11-12	Georgia Party
May	11-12	OZ CCA C.W.
May	18-19	OZ CCA Phone
May 31-June 3		CHC/HTH Party

YL/OM Party

Phone

Starts: 1:00 P.M. EST Saturday, March 2nd
Ends: 12:00 M. EST Sunday, March 3rd

C.W.

Starts: 1:00 P.M. EST Saturday, March 16th
Ends: 12:00 M. EST Sunday, March 17th

This is the 14th year in which the YLs see how many OMs they can work over a contest week-end.

Check Louisa's, W5RZJ's YL Column on page 68 of last month's issue for the details on how you can make the party more interesting for the YLs.

ARRL DX

Phone

Starts: 7:00 P.M. EST Friday, March 9th
Ends: 7:00 P.M. EST Sunday, March 11th

C.W.

Starts: 7:00 P.M. EST Friday, March 23rd
Ends: 7:00 P.M. EST Sunday, March 25th

This is the 2nd half of the ARRL marathon, the 1st half was run off last month. So if you didn't have time to run up a score last month, maybe you can catch up this month.

*14 Sherwood Road, Stamford, Conn.

VHF Amateur

Starts: 9:00 A.M. Local Time,
Saturday, March 16th
Ends: 9:00 P.M. Local Time,
Saturday, March 16th

A new shorty v.h.f. contest which Bob Brown explains on page 71 of last month's v.h.f. section.

Pakistan DX

Starts: 0000 GMT Saturday, March 23rd
Ends: 2400 GMT Saturday, March 23rd

This contest will fall on the same day each year in celebration of its Republic Day. However Mr. Mohd and his boys will have quite a problem this year bucking the ARRL activity on the same week-end.

Full details on Page 88 of last month's *CQ*.

Your logs go to: The Awards Manager, Mr. Mohd, AP5CP, Tigers Amateur Radio Club, Dacca Signals, Dacca 6, East Pakistan.

CQ W.W. SSB DX

Starts: 1200 GMT Saturday, March 30th
Ends: 1800 GMT Sunday, March 31st

The 7th annual sideband DX contest was covered on page 71 of the January *CQ* by Dorothy and Irv in their SIDEBAND Column. There have been some slight rules modifications and the usual compulsory 6 hour rest period is still in effect. Better check the rules.

Your logs go to: SIDEBAND Editors, 12 Elm Street, Lynbrook, N. Y.

REF

C.W.

Starts: 1400 GMT Saturday, March 30th
Ends: 2200 GMT Sunday, March 31st

Phone

Starts: 1400 GMT Saturday, April 20th
Ends: 2200 GMT Sunday, April 21st

The rules are standard for DX type contest and quite simple. In addition to contest credit your log can also be used as a reference for the many attractive French awards.

1. The usual serial numbers, RST or RS report plus a progressive 3 digit QSO number. In addition, French stations include their province in the form of a number for multiplier identification.

[*Continued on page 84*]

PROPAGATION

GEORGE JACOBS*, W3ASK

LAST MINUTE FORECAST

The following is a forecast of day-to-day propagation conditions expected during March, 1963. This forecast attempts to predict *specific* days upon which openings shown in the Propagation Charts in this column are most likely to occur, and the expected quality of the openings. For example, the following forecast shows that circuits rated (2) in the Propagation Charts are most likely to open with "good-to-fair" quality (B-C) when conditions are above normal (March 4, 7 and 30), and with "fair-to-poor" quality (C-D) when conditions are expected to be normal. Circuits rated (2) are not expected to open on those days forecast to be "disturbed', etc.

PREDICTED PROPAGATION CONDITIONS & CIRCUIT QUALITY

Prop. Chart Forecast Rating	*Above Normal Days (WWV rating 6 or higher)* Mar. 4, 7, 30	*Normal Days (WWV rating 5)* Mar. 3, 5-6, 8, 13-14, 19-20, 24-26, 29, 31	*Below Normal Days (WWV rating 4)* Mar. 1-2, 9, 12, 15, 18, 21, 23, 27-28	*Disturbed Days (WWV rating 3 or less)* Mar. 10-11 16-17, 22
(1)	C	D-E	E	E
(2)	B-C	C-D	D	E
(3)	A-B	B-C	C-D	D-E
(4)	A	A-B	C	D

Where:

A—An excellent opening with strong steady signals.

B—A good opening, moderately strong signals, with little fading & noise.

C—A fair opening, signals fluctuating between moderately strong & weak, with moderate fading and noise.

D—A poor opening, signals generally weak, with considerable fading and high noise level.

E—A very poor opening, or none at all.

TWENTY meters is expected to be the best band for DX openings from sunrise to sunset during March. Some 15 meter openings are also predicted for the daylight hours. Except for infrequent daytime openings to tropical or southern areas, very few 10 meter openings are expected during the month.

During the period from sunset to sunrise, 40 meters is expected to be the optimum band for DX propagation. DX openings are also predicted for 80 meters during the hours of darkness, and some 160 meter DX openings may also be possible during this period.

*11307 Clara St., Silver Spring, Md.

For specific times of DX openings for each amateur band 10 through 160 meters during March, refer to the DX Propagation Charts which appeared in last month's column. This month's column contains Short-Skip Propagation Charts for March and April, as well as Charts centered on Hawaii and Alaska. The Short-Skip Charts contain propagation forecasts for distances between 50 and 2300 miles.

VHF Openings

Ionospheric propagation may be possible on the v.h.f. amateur bands during auroral disturbances (see "Last Minute Forecast" for likely dates), which occur frequently during March. Meteor-type ionospheric openings are likely to occur on March 10-12 and 20, when minor meteor showers are expected.

Sunspot Cycle

The sunspot cycle continues to decline. The Zurich Solar Observatory reports a monthly sunspot number of 23 for December, 1962. This results in a 12-month running smoothed sunspot number of 37 centered on June, 1962. The sunspot cycle is based on the smoothed sunspot number.

Sunspot activity at the present time is at about the same level as was observed during the spring months of 1953 and 1955. A smoothed sunspot number of 26 is predicted for March, 1963.

DX Contest Post Mortem

The forecast for generally "poor-to-fair" propagation conditions made last fall in this column for the 1962 *CQ* DX Contest seems to have been "right on the button", according to comprehensive propagation data now available from the Central Radio Propagation Laboratory of the NBS, and from dozens of reports received from Contest participants.

The Phone Section of the Contest began with poor-to-fair conditions (a CRPL rating of 4) at 1900 EST, October 26. On October 27 conditions varied between poor and fair, with an overall CRPL rating of 4 (poor-to-fair) for both trans-Atlantic and trans-Pacific circuits. For a brief period during the daylight hours of October 28, conditions rose above fair, but for the remainder of the time they varied between poor and fair. CRPL rated trans-Atlantic circuits 4 on the 28th, and trans-Pacific circuits 5 (fair).

The C.W. Section of the Contest began with poor-to-fair conditions at 1900 EST, November 23. Conditions remained poor-to-fair during most of the 24 and 25, except for brief periods during the daylight hours when they rose to fair-to-good. Overall CRPL ratings for November 24 and 25 were 4 for trans-Atlantic circuits and 5 for trans-Pacific circuits.

A large number of solar flares occurred during the Contest period, resulting in sporadic periods of high noise levels. The noise levels associated with these solar flares were reported by a large number of radio amateurs in the Contest.

Conditions during the 1962 *CQ* DX Contest were more or less what were expected during the present phase of low solar activity. There were very few 10 meter openings from the United States, 15 meters was spotty, and 20 meters opened for DX only during the daylight hours. During the nighttime hours, DX conditions on 40 and 80 meters seemed to have varied between "fairly good" and spotty". Scores during the 1962 Contest are likely to be considerably lower than they were during previous years of higher solar activity. 73, George, W3ASK

CQ Short-Skip Propagation Chart

March-April, 1963

Band Openings Given in Local Standard Time

At Path Mid-Point (24-Hour Time System)

Band (Meters)	*50-250 Miles*	*250-750 Miles*	*750-1300 Miles*	*1300-2300 Miles*
10	*Nil*	*Nil*	08-20 (0-1)	08-15 (1-0) 15-18 (1) 18-20 (1-0)
15	*Nil*	09-16 (0-1)	09-13 (1) 13-16 (1-2) 16-18 (0-1)	08-09 (0-1) 09-10 (1) 10-13 (1-2) 13-14 (2) 14-16 (2-3) 16-18 (1-2) 18-20 (0-1)
20	*Nil*	07-12 (0-2) 12-16 (0-3) 16-18 (0-2) 18-23 (0-1)	06-07 (0-1) 07-08 (2) 08-10 (2-3) 10-12 (2-4) 12-16 (3-4) 16-18 (2-4) 18-19 (1-3) 19-21 (1-2) 21-23 (1)	06-07 (1-0) 07-08 (2-1) 08-10 (3-2) 10-15 (4-3) 15-18 (4) 18-19 (3-4) 19-21 (2-3) 21-23 (1-2) 23-01 (0-1)
40	06-07 (0-1) 07-08 (1-2) 08-10 (2-4) 10-17 (3-4) 17-19 (2-3) 19-21 (1-2) 21-23 (0-1)	06-07 (1-2) 07-08 (2) 08-15 (4-3) 15-17 (4) 17-19 (3-4) 19-21 (2-3) 21-23 (1-2) 23-06 (0-1)	06-08 (2) 08-15 (3-1) 15-17 (4-2) 17-19 (4-3) 19-21 (3-4) 21-23 (2-4) 23-02 (1-3) 02-06 (1-2)	06-08 (2-1) 08-15 (1-0) 15-16 (2-0) 16-17 (2-1) 17-19 (3-2) 19-21 (4-3) 21-02 (3-4) 02-05 (2-3) 05-06 (2)
80	07-08 (2-3) 08-10 (3-4) 10-18 (4) 18-20 (3-4) 20-22 (2-3) 22-01 (1-2) 01-05 (1) 05-07 (1-2)	07-08 (3-2) 08-10 (4-1) 10-16 (4-0) 16-18 (4-2) 18-20 (4-3) 20-22 (3-4) 22-01 (2-4) 01-05 (1-2) 05-07 (2)	07-08 (2-1) 08-10 (1-0) 10-16 (0) 16-18 (2-1) 18-20 (3-2) 20-01 (4) 01-05 (2-3) 05-07 (2)	07-08 (1-0) 08-16 (0) 16-18 (1-0) 18-20 (2-1) 20-22 (4-2) 22-01 (4-3) 01-05 (3) 05-07 (2-1)
160	05-07 (4-2) 07-09 (3-1) 09-17 (2-0) 17-19 (3-1) 19-20 (4-2) 20-05 (4)	05-06 (2-1) 06-07 (2-0) 07-09 (2-0) 09-17 (0) 17-19 (1-0) 19-20 (2) 20-22 (4-3) 22-03 (4) 03-05 (4-3)	05-06 (1) 06-19 (0) 19 20 (2-1) 20-22 (3-2) 22-03 (4-3) 03-05 (3-2)	05-06 (1-0) 06-19 (0) 19-20 (1-0) 20-22 (2) 22-03 (3-2) 03-05 (2-1)

Hawaii To:

*Openings Given in Hawaiian Standard Time**

TO:	*10/15 Meters*	*20 Meters*	*40 Meters*	*80/160 Meters*
Eastern USA	12-15 (1)† 06-08 (1) 08-12 (2) 12-15 (3) 15-16 (2) 16-17 (1)	02-05 (1) 05-07 (2) 07-13 (1) 13-15 (2) 15-17 (3) 17-18 (2) 18-20 (1)	18-19 (1) 19-21 (2) 21-00 (3) 00-02 (2) 02-03 (1)	19-21 (1) 21-00 (2) 00-02 (1) 22-00 (1)‡
Central USA	11-16 (1)† 06-08 (1) 08-13 (2) 13-16 (3) 16-17 (2) 17-18 (1)	05-08 (2) 08-13 (1) 13-15 (2) 15-16 (3) 16-18 (4) 18-19 (3) 19-20 (2) 20-22 (1)	18-19 (1) 19-21 (2) 21-01 (3) 01-04 (2) 04-05 (1)	19-21 (1) 21-01 (3) 01-02 (2) 02-03 (1) 22-01 (1)‡
Western USA	10-12 (1)† 12-14 (2)† 14-16 (1)† 07-08 (1) 08-09 (2) 09-11 (3) 11-15 (4) 15-17 (3) 17-18 (2) 18-19 (1)	04-06 (2) 06-11 (4) 11-15 (3) 15-17 (4) 17-19 (3) 19-21 (2) 21-00 (1)	17 19 (1) 19-20 (2) 20-23 (4) 23-05 (3) 05-06 (2) 06-07 (1)	19-20 (1) 20-21 (2) 21-04 (3) 04-05 (2) 05-06 (1) 20-22 (1)‡ 22-02 (2)‡ 02-04 (1)‡

Alaska To:

Openings Given in Alaskan Standard Time§

TO:	*10/15 Meters*	*20 Meters*	*40 Meters*	*80/160 Meters*
Eastern USA	13-16 (1)	13-15 (1) 15-17 (2) 17-19 (1)	22-04 (1)	*Nil*
Central USA	11-14 (1)† 11-17 (1)	15-18 (1) 18-19 (2) 19 20 (1)	23-04 (1)	*Nil*
Western USA	11-15 (1)† 11-18 (1)	10-15 (1) 15-18 (2) 18-21 (1)	00-06 (1)	01-05 (1)

Forecast Ratings

The numerical ratings appearing in parenthesis following each predicted time of opening indicate the *total* number of days during each month of the forecast period that the opening is expected to occur, as follows: (1) Less than 7 days; (2) Between 8 and 13 days; (3) Between 14 and 22 days; (4) More than 22 days.

On the Short-Skip Propagation Chart, where two numerals are shown within a single set of parenthesis, the first applies to the shorter distance for which the forecast is made, and the second to the long distance.

For the *specific* days of each month on which a particular opening is most likely to occur, as well as a day-to-day forecast of reception conditions (signal quality, noise and fading levels), see the "Last Minute Forecast" which appears at the beginning of this column.

All times are shown in Local Standard Time, using the 24-hour time system. In this system midnight is shown as 00, 01 is 1 AM, 02 is 2 AM, etc. Noontime is shown as 12, 13 is 1 PM, 14 is 2 PM, etc.

The *CQ* Short-Skip Propagation Charts are based upon a c.w. effective radiated power of 75 watts from a half-wave dipole antenna, a half-wave or higher above ground. The Charts are valid through April 30, 1963. These forecasts are based upon basic propagation data published monthly by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

*Hawaiian Standard Time is 5 hours *behind* EST; 4 hours *behind* CST; 3 hours *behind* MST; 2 hours *behind* PST and 10 hours *behind* GMT.

†Indicates possible 10 meter openings from Hawaii and Alaska.

‡Indicates possible 160 meter openings from Hawaii and Alaska.

§Alaskan Standard Time (from Skagway to 141 degrees west longitude), is 4 hours *behind* EST; 3 hours *behind* CST; 2 hours *behind* MST; 1 hour *behind* PST and 9 hours *behind* GMT.

sideband sideband sideband

SIDEBAND

IRV & DOROTHY STRAUBER*, K2HEA/K2MGE

SSB DX HONOR ROLL

TI2HP	280	VK3AHO	249	G2BVN	231
VQ4ERR	278	K2MGE	248	K6ZXW	231
W8EAP	275	W3MAC	243	K1IXG	230
W2ZX	272	W1LLF	242	WØCVU	230
W8PQQ	271	W3KT	241	K6MLS	227
PY4TK	267	W6PXH	241	W1AOL	227
W2FXN	267	W2VCZ	241	G3FKM	226
HB9TL	264	W6BAF	241	W2YBO	225
MP4BBW	261	PZ1AX	240	W2NUT	225
W6UOU	260	WØUUV	239	W2VZV	219
W3NKM	259	W6RKP	238	UA3CR	217
WØQVZ	259	W5IYU	237	UR2AR	215
K4TJL	257	I1AMU	237	WA6EYP	214
K9EAB	256	DL1IN	236	WA2IZS	213
K8RTW	253	G3NUG	235	K4AJ	213
W3LMA	251	W8YBZ	235	W1UOP	211
W5AFX	250	W6WNE	232		

CQ SSB ENDORSEMENTS AND CERTIFICATES

Q4ERR	275	EI8P	125	W6KUT	100
2NUT	225	K5AWR	125	UW9AF	75
R2AR	200	DL4FC	125	WA6ESB	75
R2AR	175	EP2AG	125	K5UYF	50
P2AG	175	UA1CK	100	UW9AF	50
4PAA	150	GD3ENK	100	K3GZE	50
4HYL	150	G3HSR	100	WØALA	50
P2AG	150	K5FLD	100	K5FLY	50
		GI6TK	50 (75 m)		

HERE'S a final reminder to take part in the 7th Annual *CQ* Worldwide SSB Contest to be held from 1200 GMT, Saturday, March 30, to 1800 GMT, Sunday, March 31, with only 24 hours of operating permitted. The

2 Elm St., Lynbrook, New York.

With Sideband Dinner time here again, just look at the nice people you're apt to meet (l. to r.), Helen, XYL of K3LNA; Doc, K1IOW; and Claire, XYL of W3FAK; incidentally, the K3LNAs, K1IOWs, and W2ENMs got together in January for a holiday in Puerto Rico where they hoped to meet again many of the KP4s they had met at last year's Sideband Dinner.

Here are four of the most recently licensed amateurs in Morocco, (l. to r.) Al, CN8FK/K5BZU; Chuck, CN8FG; Neff, CN8FI/WA2UHT; and Pitt, CN8IU. Al, President of the Nouasseur ARC, writes that a new QSL Bureau for American hams in Morocco has been set up; the address, c/o American QSL Service of Morocco, Box 2104, APO 30, New York, N. Y.

object of the Contest is to work as many different prefixes and stations on 2-way single sideband as possible. Complete rules and regulations appeared in the SIDEBAND Column in January, so check back and acquaint yourself with them.

Due to technical difficulties, we were unable to get the prefix check lists ready in time for this Contest so you can cross out that sentence in the rules which said they were mandatory. However, we do suggest that you personally make up some kind of prefix check list to help you eliminate duplication of prefixes.

If you rush a double-stamped, self-addressed envelope to the SIDEBAND Editors at their home address, there is still time to receive log forms on which to enter your contacts and, we hope, run up a winning score. Good luck to one and all! We're keeping our fingers crossed for good propagation on all bands and for an outstanding participation of sideband stations from all over the world.

Deletion of Sideband DX Credits

Over the years, as sideband activity has risen to dominate the DX scene, much discussion has taken place among knowing hams regarding the position of credits for countries no longer in

Here's Tom Preece, VK2NN, of Laura, Australia, who's been singing the praises of sideband operators ever since last year's Contest when he had his first chance to observe sideband operating. We're looking forward to Tom's being in this next Contest as well.

Jean Treskin, VE2BCT, sends along this very fine pho of himself at the operating position of his shac Using the Heath Apache with an SB-10 to drive home-brew g.g. linear with an input of 700 watts p.e.p the Mosley TA-33 Jr., and the Heath Mohawk receive Jean has surrounded himself with other operating ai to help in his keen enjoyment of sideband. He operat between 14.110-14.130 between 1730-1830 GMT ar 2200 GMT until the band folds and answers s.s.b., a. and c.w.!

existence. With these countries no longer in existence, it did not seem fair to permit credit for them to remain on some DXers' lists whereas others would never have the chance to earn similar credit.

The latest of these countries to go out of existence was, of course, Ruanda-Urundi, 9U5. We started the ball rolling in December, 1962, by deleting credit received for Ruanda-Urundi, when confirmations were submitted for Rwanda and/or Burundi. Following this step, it is completely inconsistent to permit the retention of credit for similar situations. Therefore, with the approval of *CQ*'s DX Editor, Urban LeJeune, W2DEC, the following announcement is made:

"Starting May 1, 1963, credit for the following countries will be deleted from 2-way s.s.b. DX lists: Gold Coast, ZD4; Italian Somaliland, I5; British Somaliland, VQ6; Tangier, KT1/CN2; French West Africa, FF8; French Equatorial Africa, FQ8; Goa, CR8; and Ruanda-Urundi, 9U5."

If you have been credited with any of the above, please delete these credits and adjust your totals accordingly, noting this change on the next listing you send to us for credit. In those cases where your adjusted total will fall below the total necessary for a sticker or certificate which you already received, *do not* return the certificate or sticker. Notice will be taken that they have already been sent to you and when your total reaches the higher amount, the original sticker or certificate will stand.

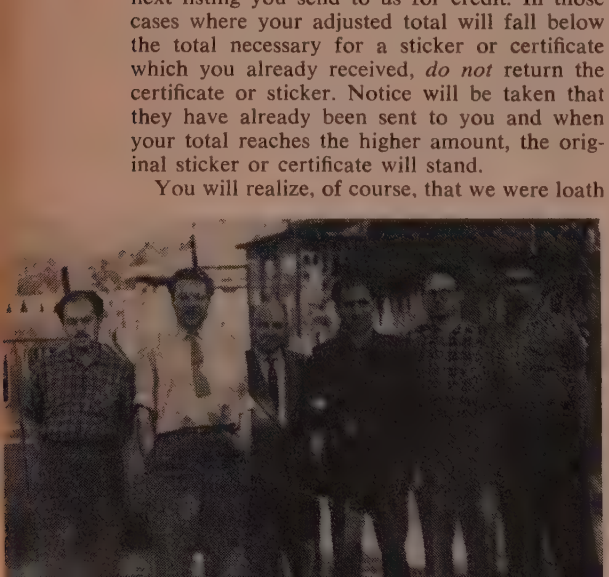
You will realize, of course, that we were loath to remove these credits form your lists bu knowing the high character of sideband DXer we are sure that no one likes to play with stacked deck of cards and that those who wi be most affected will welcome the opportuni to play the game with the same set of rules f all. This move has been a long time comin but it was inevitable and we hope will be a cepted by all with their usual spirit of goo sportsmanship.

The only deviation from the above will b in the case of credits for the K6MLS Trophi to be awarded to the first three stations in th world who submit confirmations of 2-way sid band contacts with 300 countries after March 1963. In this particular contest, the over-a totals and credits will be accepted.

Last Call For Sideband Dinner

With only about three weeks left before sid band's biggest and best social event of the yea now is the time to reserve your ticket for th 12th Annual SSBARA Sideband Dinner an Hamfest at the Statler Hilton Hotel in New Yo City on Tuesday, March 26, 1963, duri I.E.E.E. Week. Here is where you'll meet tho sands of your sideband friends and get a pr view of what's new in sideband equipment an accessories. Chairman Stan Rosenberg, WA GFV, is lining up a star-studded roster of ente tainment and Prize Chairman Mort Kah W2KR, has a number of choice prizes selecte that are guaranteed to delight the lucky winne

[*Continued on page 98*]



Here's a unique photo of some of the USSR's top sid banders grouped together for the first time. L. to UF6FB, UA3EG, UA3XZ, UD6KAB, UA3CR and UB5KA *(Photo courtesy UA3CR).*

HAM CLINIC

CHARLES J. SCHAUERS*, W4VZO

HAM CLINIC has been asked by a number of manufacturers to review certain items on these pages *without* actually testing them out—this we refused to do. A picture and some sketchy technical information does not constitute a review! When we endorse an item, readers can rest assured that it is worthy of consideration and will do what the manufacturer says it will. We do not do reviews because the advertising department tells us to, nor do we accept information on an item without thoroughly checking it out.

HAM CLINIC will continue the practice of reviewing items which are truly bargains, technically excellent and the best in their price range. In this way only, can we feel that we are offering real aid to fellow hams and performing a very worthwhile technical service.

Manufacturers who feel that they have something exceptionally outstanding to offer hams throughout the world, are encouraged to get in touch with this columnist. If equipment checked out by us does not meet with our approval and does not merit the HAM CLINIC endorsement, we will frankly advise the manufacturer and recommend modifications.

We have a complete ham-lab capable of working up to 420 mc.

We have been assured by the editor that all equipment reviews in *CQ* which are accomplished by old-timers such as Bill Scherer, W2AEF and other reputable ham-engineers are thorough and exacting; with this we do not argue.

To summarize: if a review appears in HAM CLINIC on any item of ham equipment you can bet that we are staking our reputation on our analysis—we simply do not recommend an item that is not all the manufacturer says it is. Furthermore, we ask the manufacturer for the names of hams using their equipment and query them for their comments.

Questions

Wide-band S.S.B. Linear—"Tell me, is a wide-band s.s.b. 'untuned' r.f. amplifier (linear) more efficient than a 'straight' tuned r.f. amplifier?"

No. The power output of a linear wide-band amplifier is usually inversely proportional to the overall bandwidth characteristics. Other factors are the tank impedance and tube output capacitance. For proper operation of a linear broadband amplifier, the tube output capacitance should be low and the load impedance as high as possible. These dictate the need for using a triode in a grounded grid circuit, thus assuring at least 50% greater output impedance than a neutralized triode.

Plate Efficiency—"How is the plate efficiency of an ideal linear calculated?"

Well, generally by this equation:

$$\text{Plate efficiency (percent)} = \frac{\pi}{4}\left(1 - \frac{E_{min}}{E_b}\right) 100$$

E_{min} being the smallest amount of instantaneous plate voltage during plate current flow of 180° for each full cycle.

The equation assumes a linear tube, but in practice, tubes used possess curved characteristics, so the efficiency obtained by the equation will be less.

Isotropic Antenna—"What is an 'isotropic' antenna anyway? During the last month I have heard the term two or three times."

It is an antenna (imaginary—not in existence) that produces waves that are of equal strength in every direction. It is an analytical device used by antenna engineers. It does not exist, but practical antenna performance is compared to the desired ideal performance with which the isotropic antenna has been endowed.

Dual Diversity Reception—"I would like you to tell me what dual diversity reception is. Is it practical for ham use?"

Sure. Dual diversity reception is the system of

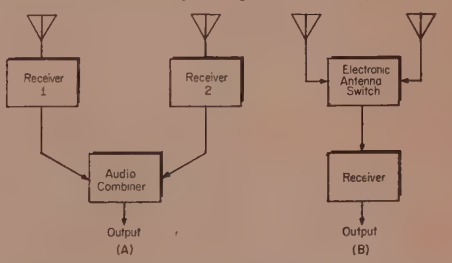


Fig. 1—Two basic systems of dual-diversity reception. The system at (A) uses two independent antennas feeding two receivers, the output of which is combined. System (B) uses two antennas but only one receiver, an electronic switch continuously switching between antennas.

*c/o *CQ*, 300 W. 43 St., New York 36, N. Y.

The Datak press-on lettering sets enable the amateur to do a professional-looking chassis and panel lettering job with a minimum of fuss.

using two radio receivers which are connected to two widely spaced antennas—the antennas usually being of the high gain type. With the two radio receivers tuned to the same frequency, audio outputs of these are combined *or* selected according to the best signal. This means that when reception on one antenna is bad or there is fading, the other antenna may have a good signal (because of the wide spacing); thus the a.f. signal output is relatively steady.

Another system uses one receiver and an electronic antenna switching device which constantly samples the signals from two antennas, selects the best, and feeds it to a receiver. It incorporates an r.f. stage and suitable detector, d.c. amplifier, etc., to perform the switching function.

Dual diversity is not practical for ham use because of the antenna problem. Also, the signal combiner-discriminator used for two receiver operation is quite complicated.

It must be remembered that diversity takes advantage of the fact that fading does not occur *simultaneously* in two widely separated antennas. Generally, it is used commercially for radio teleprinter reception, thus reducing the chance for garbles or missed characters. The diagrams in fig. 1 show the two typical installations.

Key Clicks in FSK—"Is the key click problem often experienced with c.w. keying the same as frequency shift keying as used for teleprinter operation?"

Yes, it is the same, for shifting frequency too quickly results in sharp-edged wave-forms. The keying transition must be slow and smooth enough to result in rounded characters. Abrupt changes in any keying signal will produce excessive bandwidth, and result in thumps or clicks, even though the affected receivers are tuned to a frequency some distance from the offending station's frequency.

S.S.B. to A.M.—"I have a popular brand of a commercial s.s.b. ham transmitter and I would like to modify it for full a.m. output but still retain the full s.s.b. output feature. What the problems? I would like to use an exte plate modulator."

The power supply in your commercial jo no doubt not heavy enough for sustained a operation. I would accomplish the job by bu ing a power supply with sufficient output po to handle the final tube in Class C as well as modulator. The speech, and r.f. driver circ already in the transmitter can still be usec you insert carrier. Then it would be a matter installing a switching system for full a.m. s.s.b. operation.

You could also add an external Class C fi driven by the s.s.b. transmitter in its normal l output a.m. (carrier injection) position, but y would still need a heavier final power supply.

Instant Lettering—The day is over when y must soak decals in water and then transfer th to your equipment for a lettering job.

The Datak Corp., 63-71 St., Guttenberg, N has come out with a dry transfer process wh will delight set builders.

Letters or words are instantly transferred panels or a hard smooth surface merely by erting pressure on them. The result appears be a professional lettering job (similar to silk-screen process).

Various sets are available for various p poses. Write the company whose address is giv above. Sets run about $4.95.

New Capacitors—Cornell-Dubilier (Electron Division of the Federal Pacific Electric C 50 Paris St., Newark 1, N. J. have come with a new line of foil capacitors. The capacit are 75% smaller, with voltage ratings up 12,500 volts d.c.; are protected from corrosi and the sizes range from 0.1 mf to 15.0 mf.

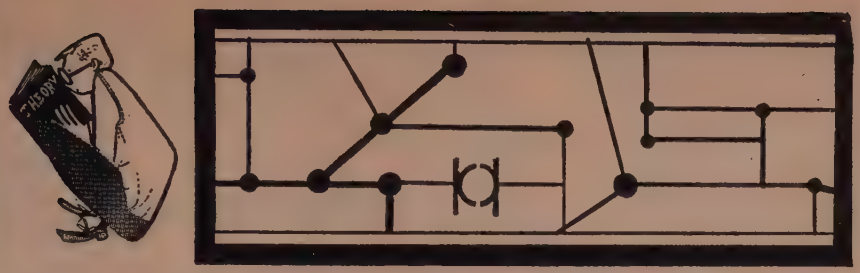
Q-Multiplier/Notch Filter—For those of y who purchased a *Q*-Multiplier/Notch Fil Model 337/S1 from the Waters Manufacturi Co. Inc., Boston Post Road, Wayland, Ma and who are experiencing oscillation or squ in your 75S-1 installation, there is a bulletin called Issue #1—337-S1 which explains how eliminate the trouble. Generally, in the f cases encountered, a change in the plate choke (RFC_1) from 6.8 mh to 5.6 mh will duce the gain of the *Q*-Multiplier/Filter so what and stop the oscillation. If you want tailed instructions on how to make the chan write Waters—they'll send you the info.

By the way, if you use their Model 3001 U versal Hybrid Coupler and have experienced feedback, all you need do is to connect t 2.7 ohms (½watt) resistors in series betwe the second contacts on switch section S_{1c} a S_{1b}—between the two resistors in series conn another 2.7 ohm resistor to ground.

Thirty

Sorry we do not have more space to ena us to ramble on and on, but a magazine can o be so large. We apologize to those of you w have not yet received replies, but be patient, y reply will come. 72, 73 and 75, Ch

NOVICE



WALTER G. BURDINE*, W8ZCV

THE amateur has always been in the forefront of any new phase of amateur radio, be it new modulation methods, new keying methods, new bands or any other significant development of the art. We can always add some new developments to any phase of the communications art. This is one of the reasons for the FCC allowing us the continued use of the many valuable frequencies. We must make use of our frequencies to keep them and we should use them for experimental purposes to further the art of communications.

As of January 2, 1963 the FCC has allowed the power limit for the 420 to 450 mc band to be raised to a full kilowatt input to the final amplifier stage. You Technicians and higher grade licensees can prove that we merit this attention by putting good crystal controlled equipment on this band and keeping it in operation frequently. We can use almost any mode of operation on this band. It is the lowest band that we can operate television and we can do a lot with that A5 emission if we try. Television equipment is not too expensive for the amateur and high power tubes for the final are just as cheap as tubes for the lower bands.

Antennas can be bought and erected more easily than for the lower bands. They are physically small, therefore they can be built in the average home workshop. Light weight material can be used to construct a big, light-weight, low wind-resistance antenna that can be mounted on a good TV rotator. Many construction articles will be found in the magazines and more will come. Don't forget that 432 mc signals have been heard 2,540 miles and now there are possibilities for moon-bounce operations as well. Let's give it a try.

Ham Radio The P.C. Way

Recent developments in transistors and printed circuits have made possible light weight portable equipment without sacrificing performance and with the lowest possible power consumption. I am now working on a completely transistorized ham receiver and s.s.b. exciter to add to my station. The receiver is too complicated for a write-up but each item is being constructed on a small board so that any portion may be changed without bothering the rest. I do this by interconnecting a few wires. It has a Collins Mechanical filter and should give a good account of itself.

A few years ago the Dayton Amateur Radio Association decided to go all out to win the January v.h.f. Sweepstakes and Ev Taylor, W8NAF came out with a printed circuit transmitter that really put a group of new operators on the v.h.f. bands, he had the converter for them too and we came in second that year. I have used the unit pictured here for an exciter and transmitter and had plenty of good QSOs. He furnished these units at cost to anyone that would operate in the contest and some of us bought them and built modulators and power supplies along with the converter for some of the operators that otherwise would not have gotten them. Ev has moved to Scottsdale, Arizona, and I hope he does as well for the Phoenix group.

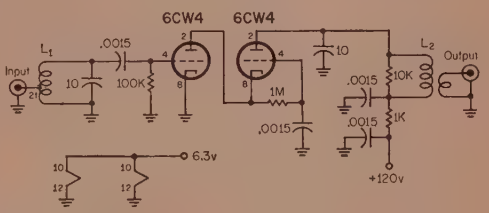


Fig. 1—Schematic diagram of the 6CW4 Nuvistor preamp for 6-meters built by W8VFT. Although a printed circuit board was used for the original, good results can be had from a conventionally-wired version. Coils L_1 and L_2 are 11 turns #18e. ½" dia. Closewound. Spread turns to adjust tuned circuits to frequency. The output link is two turns of hookup wire on the cold end of L_2.

Nuvistors came along and I thought that I wouldn't fool with them since I was having so much fun with transistors, but I just happened to hear one of W8VFTs Nuvistor pre-amps in use one night and I now have a six and two meter version. The results caused me to buy about 35 dollars worth of Nuvistors. You will soon see why—I've been working for a while on a Nuvistor six-meter converter and a combined two-meter and six-meter converter using Nuvistors.

[*Continued on page 92*]

*R.F.D. 3, Waynesville, Ohio.

SPACE COMMUNICATIONS

GEORGE JACOBS*, W3ASK

TELSTAR, RELAY, SYNCOM, and ECHO are examples of the important role space satellites are playing in the development of *new* systems and techniques for improving long-distance communication. There are, however, other ways in which scientific satellites are contributing important information for improving *conventional* means of radio communication. One such satellite is ALOUETTE, which is now probing the secrets of the ionosphere in the hopes of improving communications by ionospheric reflection.

Since its discovery in 1924, the underside of the ionosphere up to a height of approximately 300 miles has been chartered by pulse-sounding equipment located at more than 150 ionospheric measuring stations throughout the world. By this method, much has been learned about the ionosphere, and the information has been used effectively for planning long-distance radio communications.

The ionosphere still holds many secrets which are beyond the range of ground-based pulse-sounding equipment. Changes often occur in the ionosphere which cannot be predicted or explained in light of present day knowledge. Radio storms and auroral displays often occur which may "blackout" high frequency communication for long periods of time. With the advent of space satellites, it is now possible to explore the ionosphere above the range of ground-based equipment, and in greater detail.

ALOUETTE Satellite

ALOUETTE, designed and built entirely by Canada, was launched by NASA on a cooperative basis on September 29, 1962. ALOUETTE is part of NASA's Topside Sounder Program, the purpose of which is to investigate the unexplored regions of the ionosphere. It is hoped that ALOUETTE and other satellites planned for the program, will solve some of the secrets about the natural phenomena which makes possible long-distance radio communication.

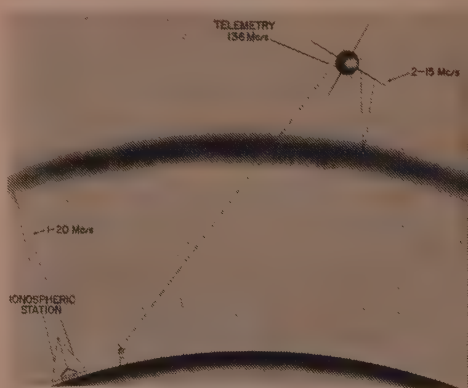
ALOUETTE is travelling in a near-circular polar orbit approximately 625 miles above the earth's surface. The satellite completes an orbit every 105.5 minutes.

ALOUETTE's payload contains a special sweep-frequency transmitter which probes th ionosphere beneath the satellite with pulse radio-frequency signals. The transmitter operat in the frequency range of 1.0 to 11.5 megacycle and sweeps through this entire range in approx mately 12 seconds. The unique antennas use with this transmitter were stored within th spacecraft at launch, then unreeled through guid sleeves to form the rigid elements of a set crossed dipoles, one measuring 150 feet tip-to-t and the other measuring 75 feet. These are b lieved to be the longest antennas used to date a space vehicle.

An f.m. telemetry system, with four whip a tennas mounted in a turnstile array, transmi back to earth the delay time found at each fr quency within the swept range. The delay tim provides information concerning the degree ionization, the height of the topside of the ion sphere, as well as other factors. The telemet transmitters send on frequencies of 136.590 an 136.080 megacycles, and at power levels of 0.2 and 2.0 watts, respectively. Both transmitte operate simultaneously to provide a safety fact in case of failure, and both operate on groun command to preserve battery power.

The satellite also contains a beacon transmitt

[*Continued on page 100*]



The ALOUETTE satellite probes the topside of ionosphere while conventional ionospheric measur stations probe the ionosphere's lower side. Res from these measurements are expected to give a m complete picture of the ionosphere's behavior, a may eventually permit more efficient high freque radio communication. *(NASA Photo).*

*11307 Clara Street, Silver Spring, Md.

VHF

DONALD L. STONER*, W6TNS

"It don't do a thing, if it ain't got some zing!" Modulation, I mean. One of the most important considerations in v.h.f. operation is having good modulation. How often have you said, "That fellow would be good copy if only he had more modulation?" An excellent example of the results of good modulation is the Heath "Sixer" and "Two'er". Although these rigs have only a few watts of output, they are superbly modulated and for this reason have the reputation of really "getting out."

Basically, the scheme of high level amplitude modulation involves connecting the audio voltage in series with the B+ supply to the plate of the final amplifier. Thus on the positive modulation peaks, the plate voltage doubles and during the negative peak, the plate voltage drops to zero. The classic illustration of what happens to the r.f. output of the transmitter is shown in fig. 1.

Fig. 1—Modulated and unmodulated signals as seen on a scope. Note that 100% modulated positive peaks are twice the unmodulated carrier level and output reaches exactly zero on negative peaks.

You can see that with 100% modulation, the peak voltage will double and go to zero. Since power is equal to $E^2 \div R$ (R being the impedance of the transmission line), obviously the peak power output is four times the unmodulated output. This is the clue to the importance of "full" modulation. If the voltage does not double (such as less than 100% modulation), the power output will not be four times. Since we are dealing with the square of the voltage, levels less than 100% cause a larger decrease in peak power output.

Thus, rule number one for a performing transmitter is: *Keep your modulation as close to 100% as possible.*

Fine, but how do we determine this and know where to set the gain control for 100% modulation? Initially there is only one correct way and that is with an audio oscillator and oscilloscope. The ARRL Handbook describes the techniques for making these measurements but at v.h.f.,

* Alta Loma, California.

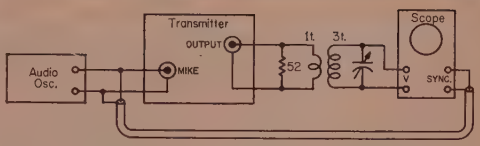


Fig. 2—Modulation monitoring setup suitable for v.h.f. Transmitter output is terminated in a dummy load, the voltage across this load being applied to the vertical plates of the scope.

sometimes difficulty is encountered in getting enough r.f. energy to the scope. A set-up, used successfully at W6TNS for some time, is shown in fig. 2. The leads between the coil and vertical deflection plate connections on the scope should be as short as practical.

With this set-up, in most cases, you will see the classic modulation envelope and can determine the best settings for the transmitter adjustments. If your transmitter is one of those which doesn't "get out," you might see a trace which indicates an inability to 100% modulate. If the final drive, or the operating voltages are not correct, the peaks may be flat-topped. Remember, this is where the peak power is concentrated and the condition which causes the flat topping should be corrected.

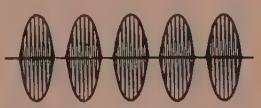


Fig. 3—Overmodulation as seen on a scope. On downward modulation peaks the transmitter final is cut off giving no normal r. f. output. During these periods, however, spurious signals are developed called splatter.

Overmodulation also causes loss of readability. Since the r.f. power output cannot go below zero, the negative-going peaks are clipped off as in fig. 3. This distortion of the waveform causes splatter which can interfere with your fellow amateurs. It also causes your signal to sound rough and harsh. This brings us around to rule number two: *Do not exceed 100% modulation.*

Thus, we have created a paradox. Keep the modulation near 100%, but don't exceed it. If you want to keep a scope on the rig at all times, fine, but most hams prefer not to tie up their equipment this way. Others must borrow a scope and cannot afford to purchase one just for occasional modulation checks.

A simple gadget to solve this dilemma with a

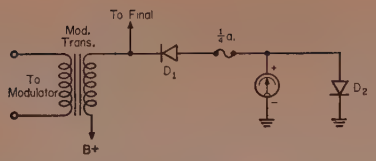


Fig. 4—A simple overmodulation indicator that can be installed in many a.m. transmitters. See text for details.

cash outlay of $5.00 or so, is shown in fig. 4. Here's how it works. The diode D_1 is reverse biased by the B+ voltage (note the cathode is positive) and does not conduct. However, during 100% modulation conditions, the negative cycles will try to go below zero and causes diode D_1 to conduct. This causes a pulse of current to flow through the meter. Naturally the meter kicks up due to the current flow. Thus, when using the circuit, you simply increase the mike gain until the meter just starts to kick on voice peaks. This will correspond to 100% modulation. The purpose of D_2 is simply to protect the meter. Should D_1 short out, it will cause D_2 to conduct and blow the fuse preventing meter burnout. Diode D_1 should have at least a 600 volt p.i.v. rating with a higher voltage preferred. Diode D_2 can have any p.i.v. rating but should have a 500 ma current carrying capacity. The fuse is a ¼ ampere fast blow type.

Because of its importance, we'll continue the discussion next month with some tricks you can build into your rig and "soup up" the modulation.

Duo Band Antenna

Many amateurs, myself included, would like to erect an antenna farm, but are plagued by limited space. In my case, I nearly lost my wife, children and dogs (in that order) when I proposed putting up a second tower in the back yard.

An easier solution, which kept the family unit intact, was the installation of a Hy-Gain "Duo-Band" two and six meter beam. This little gem weighs only 8.5 pounds and can be installed atop any light weight tower or even a slender mast used for television antennas.

The theory of operation is based on trap disconnect the two sections of the parasitic ments. On two meters, the traps are electric open which effectively shortens the elem length. On six meters, the traps appear as vir short circuits to increase the elements to resonant length. The radiating dipole is resona on both bands and no traps are used on element.

The performance of the antenna is good few compromises are made to achieve two b operation. The s.w.r. is below 2:1 on either ba

The front-to-back ratio, side lobe reject and forward gain is about the same as fo three element beam. The construction of traps is satisfactory for most environments though heavy ice loading near the tips mi cause breakage. Considering the low price $32.98, the "Duo-Band" is an excellent buy anyone who needs a v.h.f. two-band antenna

Let's Get Technical

This month's technical feature was borrow from the *Ragchewer*. By the way, if you are terested in subscribing to this monthly news b letin, drop a line to W4BUZ. The units featu are designed to heterodyne a 14 mc side ba signal (such as the v.h.f. "Quacker" descrit several months ago) to two meters and a lin amplifier to bring the power up to 100 watts. T amplifier is shown separately since it can a be used on a.m. and c.w. More about that lat

The heterodyne unit is shown in fig. 5. 2C51 is used as a 32.5 mc oscillator/quadrup to provide 130 mc drive. The 5763 mixer conventional and has been selected for ease tune up and high output. A 6AU6 driver sta will run the 5763 amplifier to full power outp Three tuned circuits insure freedom from spu ous signals.

Here are some construction hints. Make su the voltage regulator tube draws 10-15 ma insure proper regulation. A shield should used over the 2C51 to prevent radiation

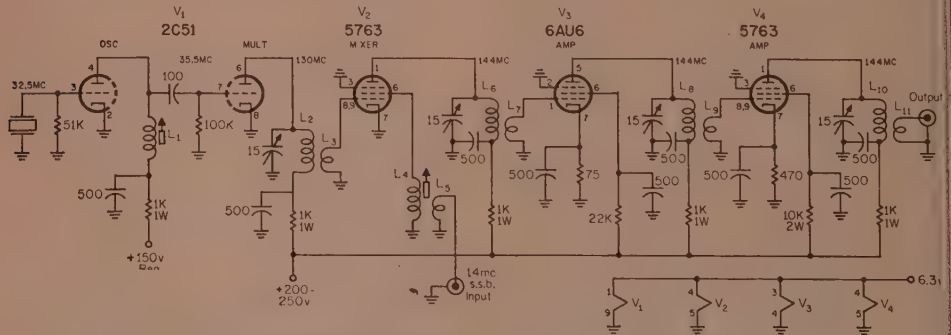


Fig. 5—Two meter sideband heterodyning unit requiring 14 mc input. Normal v.h.f. construction techniques shou be used. All resistors are ½ watt carbon unless otherwise indicated. All fixed capacitors are in mmf and d disc ceramics.

L_1—1.61 to 3.12 μh slug tuned coil. Stancor RTC-9127.
L_2, L_6, L_8, L_{10}—5 t. #16¼" dia. 1" l.
L_3, L_7, L_9, L_{11}—2 t. #22 e. at cold end of above coils.
L_4—28 t. #22 e. on ½" dia. slug tuned form.
L_5—2 t. #20 hookup wire on cold end of L_4.

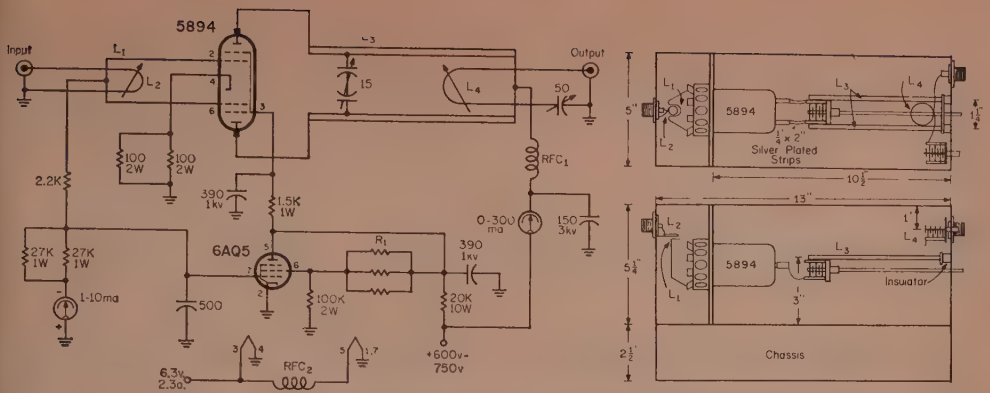


Fig. 6—Linear amplifier for two meters suitable for a.m., s.s.b., or c.w. Resistors are ½ watt unless otherwise indicated. All fixed capacitors are disc ceramics.

L_1—⅝" loop #14 e. see fig. 7 for details.
L_2—2 t. #18 ⅜" dia. link, coupled to L_1.
L_3—Tuned lines 5 ⅜" l., ¼" dia. See sketch for construction.
L_4—1 t. #18 1¼" dia. coupled to L_3.
R_1—Three 270K 1 watt carbon resistors in parallel.
RFC_1—58 t. #28 e. ¼" dia. closewound.
RFC_2—30 t. #22 e. ¼" dia. closewound.

spurious signals. The two turn link on L_2 should be cemented in place for stability. A short length of RG-58/U coax connects this link to the mixer coil and appears to improve the efficiency. If the 2C51 is not available, a 12AT7 can be used by rewiring the base. The grid and plate coils in the 6AU6 stage should have their axies 90° with respect to each other. The output tank of V_4 should be mounted above the chassis to minimize coupling between the input and output. Connecting a small trimmer capacitor in series with L_{11} may improve the ability to couple into a high power amplifier or antenna. To tune the unit up, couple a grid dipper to the oscillator plate coil L_1. Adjust the slug for maximum output and then back off slightly to insure starting each time the power is turned off and on. If a receiver is available, check around 10.8 and 21.6 mc to make sure the crystal is not oeprating spuriously on these frequencies. Next, adjust L_2 for maximum power output. Insert a watt or two of 14 mc carrier and peak L_6, L_8 and L_{10} for maximum output. A grid dipper, field strength meter or your receiver can be used for this adjustment. Spread or compress coils as required to insure that all capacitors go through a peak.

The linear power amplifier shown in fig. 6 is quite unique. It can be used on a.m., f.m., s.s.b. or c.w. with equal ease. No expensive regulated supplies are used and only filament (6.3 v., 2.3 a.) and high voltage (600-750 v., 220 ma) are required. The layout shown should make it easy to duplicate the linear. The 5894 is internally neutralized. The input and output circuits should be completely shielded from each other and

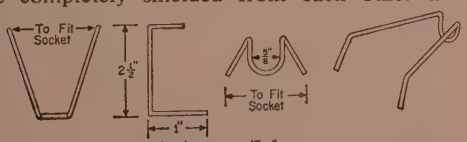


Fig. 7—Details of L_1 construction for the 2 meter linear amplifier.

silver plated if possible. The grid loop is self-resonant and therefore must be cut exactly as shown in the drawing. The flexible straps between tube and lines are made from flashing copper and should also be plated. The output link is spaced approximately 3/16" above the plate lines which are 1¼" center to center. The plate tuning capacitor is soldered to the lines and does not require a mounting bracket. The chokes are hand wound on ¼" polystrene rod. The remainder of the circuitry is not critical and can be mounted at the constructor's convenience.

In operation, the circuit works in the following manner. The 6AQ5 clamp tube has no bias and therefore conducts heavily. In effect, it acts as a small resistance between screen and ground to drop the screen voltage. As soon as any form of drive is applied to the amplifier, the 5894 draws grid current. This in turn, furnishes a negative d.c. bias to cut off the clamp tube and increases the screen voltage. Thus, the screen voltage (and therefore the output power) is in proportion to the drive signal. With 600 volts on the plate, sideband peaks will kick the plate current up to 100 ma. On c.w., 750 volts can be used and the amplifier will draw 200 ma under key-down conditions. You can also use the amplifier as an a.m. linear by driving the input to draw approximately 70 ma of plate current. Preferably, the unit should be high level modulated with a 50 watt modulator having a 3200 ohm output impedance. Under these conditions, the grid current will be around 5 ma. With 600 volts maximum on the plates and loaded to 166 ma, power input will be approximately 120 watts. When the amplifier is used as a linear, the static plate current should be approximately 40 ma. with the component values shown. Thanks to Ronald, W4BUZ for this information.

That does it for another month. Because of the extra technical information, we are holding the letters over until next month.

73, de Don, W6TNS

USA-CA RULES and PROGRAM

The United States of America Counties Award sponsored by **CQ**, is issued for confirmed contacts with specified numbers of U.S. counties under Rules and conditions hereafter stated.

A. Awards Classes

The USA-CA is issued in seven (7) different classes, each a separate achievement as endorsed on the basic certificate by use of special seals for higher class. Also, special endorsements will be made for all one band or mode operations subject to the rules.

Class	Counties Required	States Required
USA- 500	500	any
USA-1000	1000	25
USA-1500	1500	45
USA-2000	2000	50
USA-2500	2500	50
USA-3000	3000	50

USA-3079-CA for ALL counties and Special Honors Plaque

B. Conditions:

1—USA-CA is available to all licensed amateurs everywhere in the world and is issued to them as individuals for all county contacts made, regardless of calls held, operating QTH's or dates whatever.

Special USA-CA's also available to s.w.l.'s on a **heard** basis.

2—All contacts must be confirmed by QSL and such QSL's must be in one's possession for identification by certification officials.

3—Any QSL card found to be altered in any way disqualifies applicant.

C. County Identity:

1—The Directory of Post Offices (P.O.D. Publication #26) will be the official guide in determining identity of counties of contact as ascertained by name of nearest municipality. It is suggested a copy of P.O.D. Publication #26 be obtained to facilitate operating reference and precheck cards for application purpose. Publication #26 is available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. (Price $2.50).

2—Unless otherwise indicated on QSL cards, the QTH printed on cards will determine county identity.

3—For mobile and portable operations the postmark shall identify the county unless information stated on QSL cards make other positive identity. When in doubt of location, mobile stations should name the nearest municipality as identified by road sign or road map.

4—In the case of Cities, Parks or Reservations not within counties proper, applicants may claim any one of adjoining counties for credit.

D. Administration of USA-CA Program:

1—The USA-CA program will be administered by a **CQ** staff member acting as USA-CA Custodian, and all applications and related correspondence should be sent direct to him at his QTH.

2—Decisions of the Custodian in administering these Rules and their interpretation including future amendments are final.

E. Record Book and Bookkeeping:

1—The scope of USA-CA makes it mandatory that special Record Books be used for application. For this purpose **CQ** has provided a 108 page, 8½ × 11" Record Book which contains application, and certification forms, a USA county map, maps of each of the 50 U.S. States showing county outline, and which provides record-log space meeting the conditions of any Class award and/or endorsement requested.

2—A completed USA-CA Record Book constitutes medium of basic application and becomes the property of **CQ** for record purposes. On subsequent applications for either higher classes or for special endorsements, applicant may use additional Record Books to list required data or may make up own alphabetical lists conforming to requirements. In this connection, through a printer's bust, the Record Books left out the column for naming Cities/Towns, mandatory to validate County identity, so it is suggested that the time/date column be renamed and used for this purpose.

3—Record Books are to be obtained **directly** from **CQ**, 300 West 43rd Street, New York 36, N. Y. for $1.25 each. Recommend two be obtained, one for application use and one for personal file copy.

F. Application:

1—Make Record Book entries necessary for county identity and enter other log data necessary to satisfy any special endorsements (Band/Mode) requested. It is mandatory that Cities and Towns or other specific location be named.

2—Complete application forms provided in Record Book, or, if preparing own lists for later applications, use special application forms available from the Custodian for s.a.s.e. or 1 IRC.

3—Have the certification form provided signed by two licensed amateurs (General Class or higher) or an official of a national-level radio organization or affiliated club, verifying that QSL cards for all contacts as listed have been seen. The USA-CA Custodian reserves the right to request any specific cards to satisfy any doubt whatever. In such cases applicant should send sufficient postage for return of cards by registered mail.

4—Send original completed Record Book and certification forms and handling fee of $1.00 U.S. or 10 IRC's to USA-CA Custodian, Clif Evans, K6BX, Box 385, Bonita, California. For later applications for higher class seals, send either Record Book or self prepared list per the rules and 25¢ or 3 IRC's handling charge. For application for later special endorsements (Band/Mode) where certificates must be returned for endorsement, send certificate and 50¢ or 5 IRC's for handling charges. Note: At the time any USA-CA award certificate is being processed there are no charges other than the basic fee regardless of number of endorsements or seals; likewise, the Directory's "Top Class Rule" prevails and one may skip lower classes of USA-CA and get higher classes without losing any lower awards credits or paying any fee for them. ■

IN JUST two short years the USA-CA Program has become a world institution. Thousands the world over now have joined USA-CA's fun unlimited. More and more folks have come to realize USA-CA's wide scope of personal achievement coverage and its new healthy approach toward hamdom enjoyment. Likewise, the thinking ham has become aware that here is a vast program which not only supports hundreds of other programs, but it lets the individual be a party to such good will action. Included in USA-CA's purposes is media through which clubs may obtain bettered public relations both locally, state level, nationally and internationally. USA-CA also provides a basis for much educational matter and coverage, yet in manner that it becomes of high interest.

If any reader hasn't already delved into the hundreds of aspects and ramifications of the USA-CA Program, now is the time to do so. Once a year we republish the Rules and give a complete list of USA-CA winners. Last year the Rules were changed to permit more simplified record keeping and with choice of several economic adaptations. The Rules this year remain the same but are repeated for benefit of those who may not have a March 1962 *CQ*.

July, 1962 *CQ* pictures the beautiful 14" × 21" USA-CA Award which has border showing all fifty U.S. State flags in full color. Wherever in the world the USA-CA has been displayed, it has been the center of attraction. DX hams the world over now are turning beams toward the U.S. in seeking contacts with new counties . . . and peoples the world over, as a consequence, are learning more about the United States and U.S. hams. USA-CA is inherently a vast good-will program. If you haven't already done so . . . send for a *USA-CA Record Book* direct from *CQ*, and join the program . . . you'll be glad you did!

USA-CA HONOR ROLL

USA-CA-1000

K4BAI 1	W5NXF 4	K6KG 7
K7NHG 2	W8NAN 5	K6SXA 8
K6YMZ 3	K9EAB 6	W1GF 9

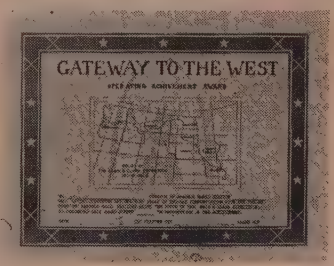
USA-CA-500

K2PFC 1-A	K7AGJ 41	VE1AE 81	XE2DS ... 121
W8IBX 1-B	DL1QT 42	VE3LZ 82	K8YBU .. 122
WØMCX ... 1-C	W9QGR 43	W1EIO 83	WN4EBE 123
PJ2AF ... 1-D	W8APN ... 44	WA6AJF . 84	VK3XB . 124
W8NAN .. 1-E	W9QWM . 45	PZ1AX ... 85	W6NUQ ...125
ZL1TB 1-F	W9CMC ... 46	K4ADU 86	K7GTK . 126
K6SXA 1-G	KØDEQ ... 47	W6FGJ 87	K9AZK ... 127
K6YMZ .. 1-H	WA2WKU .. 48	W1HOY ... 88	W8UPH .. 128
VE3BKL ... 1-I	W8WUT 49	VE3RN 89	K3HNP 129
W5PSB 1-J	KP4CC 50	WØIJM 90	K2UPD 130
KL7MF ... 1-K	K9QGR 51	W5BUK 91	W5PQA ... 131
W4UF 1-L	KØGIC 52	W8AL 92	K7CPC 132
TG9AD ... 1-M	K8GKF 53	K9QBV 93	WØTFQ .. 133
K5DGI .. 1-N	SM5CCE ... 54	W2ETS 94	ZL4CK 134
DL9PF 1-O	WA6ATY . 55	K8TBR 95	CO8JK 135
SM5WI 1-P	K6BX 56	W7NNF 96	SM7ID 136
W8WT 1-Q	W7RZY 57	W6JNX 97	W3TKQ ... 137
K9EAB 1-R	W1FPS 58	W6QIL 98	W9SZR 138
K1BUR 1-S	W8OQV 59	K4JIG 99	W1HGT ... 139
W1GKJ 1-T	K2UKQ ... 60	W3KDP ... 100	XE1AE 140
W5AWT 1-U	KØHUU 61	W5DJB ... 101	W9HUF 141
W5NXF 1-V	W5JD 62	W7VJI 102	K5MWV ... 142
K5UYF 1-W	W5EHY .. 63	W8UMR .. 103	K8ZCG .. 143
W6YC 1-X	W6UBP ... 64	W1EQ 104	I1ER 144
KH6DKA . 1-Y	W9CLH 65	K4BVD 105	K4GLA 145
Andy Rugg 1-Z	W9YT 66	G3DO 106	WØBBS 146
W6PCA 27	W4NOK 67	W2EMW 107	W4EJP 147
WØARO 28	W7NFV 68	K1KPS 108	K8QYG 148
W2FLD 29	KØIDV 69	W8KPL 109	K5ABE 149
W8CXS .. 30	F9BB 70	W3BVL 110	K5MID 150
K8EUX 31	K7GRL 71	K4ZNK 111	W9IRH 151
W3DKT 32	LU1DAB 72	W5OCX 112	W1GF 152
K4RNS 33	KØDEQ 73	W4EJQ 113	WA6MWG 153
WØIUB 34	IT1AGA 74	K8BHG 114	K4VRI ... 154
W1YPH 35	WØMLY 75	W6OJW ... 115	K6UHI 155
W6BIL 36	W5RIT 76	W8RSW .. 116	W3IMN 156
W8RQ 37	W4EEE 77	K9GDF 117	K5SBN 157
W1RWP 38	W5DQK 78	W9DGA 118	K1INO 158
W9GFF 39	K1PMY 79	K9AMD .. 119	W9OIL 159
W3BNU 40	K5IKL 80	HV1CN 120	WØPLN 160
			K2CJN 161

*United States of America Counties Award Custodian, Box 385, Bonita, California.

Georgia QSO Party

Second Annual Georgia QSO Party, sponsored by the Columbus Amateur Radio Club, Inc., 2300 GMT, Saturday, May 11 to 0500 GMT,



Pictured here is the Gateway To The West Award sponsored by the St. Louis Area (Mo.) CHC Chapter #6, and which is for working stations along the route of the Lewis & Clark Expedition, which is pictured in map form on the certificate. See December CQ, page 74, for full details of the award.

Pictured here is I1TEC, Gasparini Giancarle "Giance", CHCer #806, who represented CHC's 82nd CHC country . . . now 84 with MP4BDC and YO3RK on CHC rolls. Gianco says he is a 'modern' version of a famous and historical 'other' horseman . . . in that he operates horse/mobile as is depicted on his QSL card.

Monday, May 13. Call CQ GA and exchange QSO number, RS(T), and county, state, Province or country. A station may be contacted once per band only; c.w. to phone allowed; no cross band. Count two points each contact completed; for final score, GA Stations multiply total QSO/points by total number of different states, Provinces and countries worked; others multiply QSO/points by *different GA counties* contacted. Awards will be given winners . . . Suggested frequencies; 3595, 3995, 7060, 7260, 14060, 14260, 21060, 21310, 28060, and 26560 kc. Copies of complete logs, all data, with statement all contest rules observed, should be sent to CARC, c/o John T. Laney, K4BAI, 3500 14th Ave., Columbus, Ga., no later than May 31, 1963.

North Dakota QSO Party

The North Dakota State University Amateur Radio Society will sponsor a North Dakota QSO Party from Saturday March 9 at 1500 GMT to Monday March 11 at 0300 GMT.

The prime purpose of the QSO Party is to assist in contacts toward the NDS-CA and *USA-CA*.

QSO Party Rules: All bands may be used and the same station may be worked for additional credit on different bands. North Dakota Stations: One point per contact and multiply by total number of different states, U.S. Possessions, Canadian Provinces and foreign countries worked during contest period. Stations outside of North Dakota count five points per North Dakota station worked during contest period and multiply by total number of North Dakota Counties worked. North Dakota stations send RST or RS and county. All others send RST or RS and name of state, possession, province, or country. Copies of the logs must be postmarked not later than April 6, 1963 and should be sent to: QSO Party, NDSU ARS, E. E. Dept., Fargo, N. Dak.

Special awards will be issued to winners in each call area. Frequencies to monitor in mc.: 3.6, 3.9, 7.04, 7.21, 14.04, 14.24, 14.31, 21.04, 21.3, 21.41, 28.1, 28.6.

West Virginia Centennial QSO Party

In celebration of West Virginia's 100th Year, the State Radio Council is sponsoring a QSO Party to aid Amateurs in pursuit of the Worked West Virginia Award and the Worked All Counties West Virginia Award. The Contest will be administered by Kanawha Radio Club, Charleston.

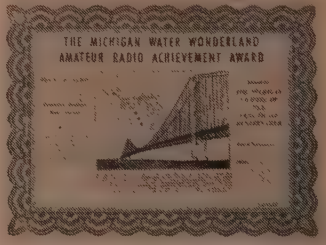
The Contest will begin 2300 GMT Saturday, March 30 and end at 0500 GMT Monday, April 1.

Suggested frequencies: 3570, 3890, 3903, 7050, 7205, 14,050, 14,300, 21,050, 21,350, 21,410, 28,050, 28,800 and 50,250 kc.

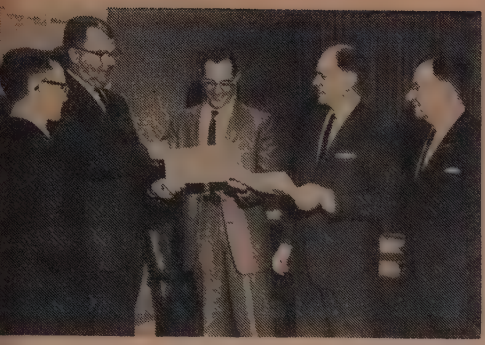
Each station may be worked twice each band; once by phone and once by c.w. West Virginia-to-West Virginia contacts do not count.

SCORING: Each complete contact counts as 1 point. Incomplete contacts do not count. Non-West Virginia stations will multiply total points by number of *West Virginia counties worked.*

Pictured here is the Mt. Airy VHF Club's "Pack Rat" gold certificate for working 30 members (Pack Rats) on any v.h.f. band after November 15, 1962. During any v.h.f. contest work 50 and state "Contest Award" application. Net contacts do not count. Send list with full log data to club c/o Custodian, W2EIF, Joseph Kilgore, #5 Sunnybrook Court, Stratford, N.J. This live-wire Club has 101 active members according to the "Mother Rat", Helen Brick who wrote welcoming the OLD MAN as new Charter member AREA, Amateur Radio Editor's Association.



Here is the attractive Michigan Water Wonderland Award sponsored by the Michigan CHC Chapter #13 for working 10 members after January 1, 1960. Endorsements each additional 10; no other endorsements. *Available* to s.w.l.s. USA is 60¢ fee; DX stations is 6 IRC. Send GCR list to Awards Manager, Les Jeffery, 3615 Mac Nichol Trail, Orchard Lake, Michigan. Michigan CHCers include W8's APN, CAT, CQ, CXS, IEC, KPL, LZV, NAN, QNW, SZS, WUT, WT, K8's CFU, CIR, CVQ, IUZ, KTZ, LSG, MFQ, NHC, ONV. The award pictures the Great Lakes Area and the Mackinac Bridge.

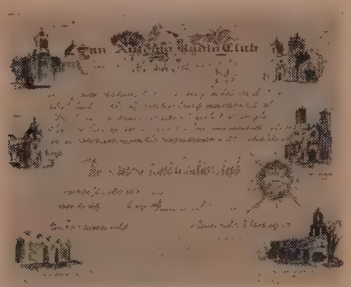


This is the official presentation of the first Kentucky "Bluegrass Colonel's Award" for working Kentucky stations. Left to right are Dan Olney, K4ZRA, Award Custodian; L. Berkley Davis, Vice President of the General Electric Company making presentations; Max Douglas, W4VJV, and Neal, W4ITC, winners; and Robert Moe, City Commissioner Owensboro, Kentucky. The Colonel's Award along with three other of a series of four Bluegrass Awards were covered in the December issue of CQ.

West Virginia stations will multiply total points by number of ARRL Sections and Countries worked. (No multi-operator stations allowed).

AWARDS: The award to the highest over-all out-of-state winner will be free attendance at our July State Radio Convention and a week's vacation at Babcock State Park, West Virginia. To the highest West Virginia over-all winner will be awarded an attractive plaque. Certificates will be awarded to the highest phone and c.w. stations, both in and out-of-state.

Contest logs should be submitted to contest chairman, Ross Kirk, K8YBU, 901 — 6th Avenue, St. Albans, West Virginia postmarked no later than May 1, 1963.



Here is a new Texas certificate by the San Antonio Radio Club, for working stations in San Antonio; DX stations including KL7 & KH6 work 5 including 2 members of SARC; U.S. Stations contact 10 including 3 members; Bexar County stations contact 25 including 10 members. Endorsements all one mode or band or mixed. No date limits. Club station W5SC counts double. San Antonio station must have recvd your QSL. DX stations is no charge; W/K stations 50¢. Available to s.w.l.s on heard basis. Send fee with GCR (certified list) list with full log data to SARC, c/o Manager, 100 N. Winston Lane, San Antonio 13, Texas. The certificate pictures seven famous historical buildings and land marks; The Alamo, 1744; Concepcion, 1716; San Fernando, 1734; San Juan Capistrano, 1731; San Jose, 1720; Espada, 1731, and the old Governor's Palace.

Here is a late photo of the Kentucky Bluegrass Counties Award. This one is a duplicate of Nr. 1, won by K6YMZ for working 20 Kentucky counties on 15 phone. Full rules of all four Bluegrass Awards was given in December, CQ. For those interested, the Bluegrass Cities Award rules has been amended to require five, rather than four contacts in named cities, of which Paducah has been deleted and Richmond and Winchester added. As we write this, K4ZRA, custodian, states 19 Bluegrass Colonel's Award, 6 county, 9 Commonwealth and 7 Cities Awards have been issued, with K4HPR winning all four!

Hawaii to Join USA-CA Fun Unlimited

Just received word the Kona Amateur Radio Club, Keauhou, Hawaii, announces sponsorship of the "Aloha State Award" for working Hawaii's five counties, of Hawaii, Honolulu, Kauai, Maui and Kalawae (Kalaupapa), postwar II. KH6 stations work two stations each county; others work one station in each of the five counties. All one mode or band or mixed endorsements. Send GCR list and $1 to Custodian, Harold Nakamura, KH6DIM, P.O. Box 263, Kealakekua, Kona, Hawaii. This Club also sponsors the "Kona" award for working members. We will bring you a picture of both these awards at later date . . . the county award is now in design stage.

What's Cooking Department

Gosh, about everything we publish in this column these days is right hot off the griddle . . . let's see . . . letter from George, K7ORN, says group in Wyoming wants to join USA-CA fun unlimited. Letter from Dick, W5RIT, says the Fort Smith, Arkansas, Radio Club might come up with an Arkansas County award real soon . . . then we still have Iowa and Alabama pending along with a few others. Keep the news, pics and sample awards coming this way, and remember, samples we get that are marked up we heave in the ash can as received . . . they are of no earthly use to us or this column. We are here to help clubs get better publicity, so help us help *you*. Good Hunting!

OLD MAN, K6BX

P.S.—In case you never got around to writing your Congressman re: Reciprocal Licensing Bill S-2361 (now dead), don't hesitate to write now for if sufficient interest is shown, the Bill is likely to be re-introduced.—*Ed.*

YL

LOUISA B. SANDO*, W5RZJ

3rd YL VHF Contest

TIME: Start—Wednesday, April 10, 1963—12 Noon EST.
End—Thursday, April 11, 1963—12 Midnight EST.

ELIGIBILITY: All licensed YL and XYL operators are invited to participate. YLRL members only are eligible for the WRONE award (a Revere silver bowl). A non-member will receive a certificate. Contacts with OM's will not count. A special certificate for the highest scoring Novice operator.

OPERATION: Bands—50 mc and above are to be used —phone and/or c.w. Cross band operation is not permitted. Only one contact with each station will be counted. A section may be counted only once toward multipliers.

PROCEDURE: Call CQ YL.

EXCHANGE: Station worked, QSO number, RST report, ARRL Section, U.S. Possession, VE District or Country. Entries in Log should also show band worked at time of contact, whether A1 or A3, time of contact, date, Xmitter and power.

SCORING: Multiply number of contacts by the total number of ARRL Sections, U.S. Poss., VE districts or countries worked. Contestants running 50 w. input or less at all times may multiply the above results by 1.25—low power multiplier.

AWARDS: Highest score—WRONE Award (YLRL member only). Top 3 scores will receive Certificates. VE district and country will receive a Certificate. Highest Novice score will receive a Certificate.

LOGS: Copies of all logs must show claimed score, be signed by operator and be postmarked not later than April 25, 1963 and received not later than May 10, 1963. Send copies of log to—Blanche Randles, K1IZT, 62 Linda Ave., Framingham, Mass. NO LOGS WILL BE RETURNED. BE SURE IT IS A COPY OF LOG YOU SEND IN FOR CONFIRMATION.

*4417 Eleventh St. N.W., Albuquerque, New Mexico

TIME to start planning for conventions ahead. First for the YLs will be the Calif YL Get-Together at the Miramar Hotel in Santa Monica, April 19-21. Cost is $11, if paid by Mar. 15; thereafter $12. It includes registration, luncheon with fashion show, Sat. dinner (a luau—wear your muumuu or grass skirt!).

The 13th Mid-west YL Convention is set for June 22-23 at Newberry, Mich. with hospitality room at the Falls Hotel. Sunday will feature a motor ship tour. Hostess club: the UPYLs, with W8HAV, Zelma, and W8JXJ, Vi, as co-chairmen.

YLRL

Note YL V.H.F. Contest rules. The V.P. adds that unless there is more participation this year the contest will be discontinued.

A new custodian for YLRL's WAC/YL award: Miriam Blackburn, W3UUG, Box 2, Ingomar, Pa.

Remember the dates of the YL-OM Contest: Phone—Mar. 2-3; C.W.—Mar. 16-17. Rules in Feb. *CQ*.

Mother/Daughter Hams

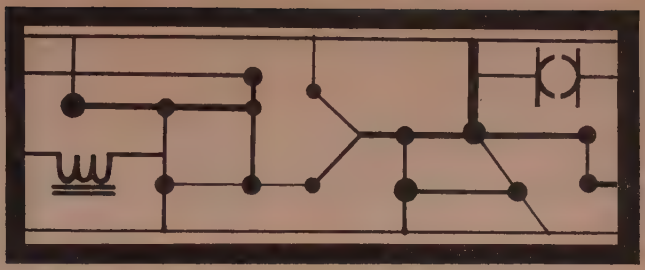
Zelma, W8HAV, and her jr. YL, K8OOY, are active mother/daughter Hams, with the OM and father being W8HAU, George. Zelma and her OM were licensed in 1955—she says she tried hard to talk him out of the hobby, but is glad that's one battle she lost! Judy got her license in '58, she says in self-defense and out of curi-

[*Continued on page 100*]

Members of the New Zealand WAROC meeting at Rotorua last spring. L. to r., front: Enid Rosan (unlic.); Florence, ZL1AXP; Judith, ZL1AWM. Back: Janette, ZL1ANA; Vicki, ZL1OC; Thelma, ZL2JO; Celia, ZL1ALK.

Mother & daughter Hams, K8OOY, Judy Schneider and W8HAV, Zelma Neault.

RTTY



BYRON H. KRETZMAN*, W2JTP

RTTY Operating Frequencies

Nets centered on frequencies given; operation usually ± 10 kc.

80 meters	3620 kc
40 meters	7040 kc ?
20 meters	14,090 kc
15 meters	21,090 kc
6 meters	52.6 mc

Two-meter radioteletype operation, using tone modulation (a.f.s.k.), has been described many times in past RTTY Columns. It is covered in complete detail in the *New RTTY Handbook*, with constructional information on autostart, the automatic control system that permits you to start up the other fellow's machine, send him a message, and then shut down his equipment . . . without anyone being present in his shack.

For many years following WW II we operated this extremely handy tool on 147.96 mc, a nationally agreed-upon channel, way up on the high end of 2 meters where we wouldn't bother anyone, especially the DX-hunters. Radio equipment consisted mostly of war surplus a.m. SCR-522, ARC-5, and ARC-3 sets. Their crystal controlled receivers eliminated tuning and drift problems and the "squelch" feature made possible completely noiseless monitoring of a channel.

Those of you who work 2 meters regularly are painfully aware of the sad history of the ARRL petitioning the FCC for the *lower* 100 kc of both 6 and 2 meters for *exclusive* c.w. use; and, its outcome: FCC Docket 12485, effective June 6, 1960, which established a 100 kc c.w. segment at the low end of 6, but which put the c.w. portion of 2 at the *high* end, 147.9 to 148.0! As the result, the DX-hounds are still using c.w. on the *low* end of 2, and the c.w. portion at the high end is woefully vacant—except for an occasional weak diathermy harmonic wandering back and forth across the barren wasteland of 100 kilocycles. The old "national" 2 meter RTTY frequency of 147.96 is therefore unusable. Years have gone by since Docket 12485 became effective. Isn't it about time we agree upon another "national" 2 meter frequency?

Selecting a Channel

Now, to select a suitable frequency for 2 meter RTTY there are several factors which should be considered:

1—Should there be separate frequencies for a.m. and f.m.?

In these modern times there are many f.m. systems, both fone and RTTY, in use all across the country.

2—Do we want a "national" RTTY channel in the RACES band?

The RACES segments are 145.17 to 145.71 and 146.79 to 147.33, where 6A2 (a.f.s.k. on a.m.) and 6F2 (a.f.s.k. on n.b.f.m.) is permitted, but 40F2 (a.f.s.k. on wide-band f.m.) is not, although 40F3 (wideband f.m. fone) *is*.

3—Do we need a second RTTY Channel on 2 Meters?

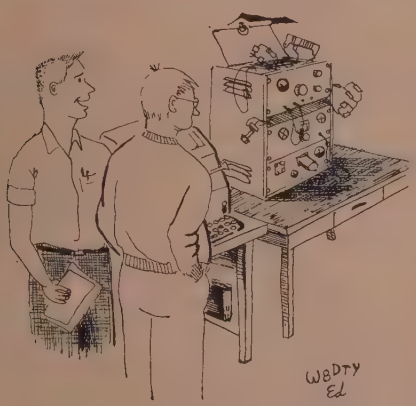
Any kind of an in-band repeater system would require another frequency on the opposite end of the band. (The New York City metropolitan area used 144.138 with 147.96 before Docket 12485.)

4—To what extent is the band being utilized today?

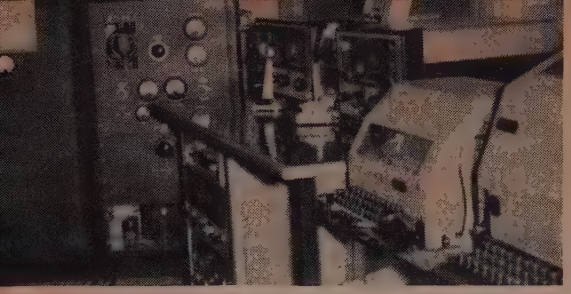
We should take into account nets and "chan-

*431 Woodbury Road, Huntington, N. Y.

RTTY The Hard Way...No. 17



"I call this my 'Modified W2JAV-W4EHU-W6AEE-W2PAT-Twin Cities Terminal Unit'."



W7SMB/6 Trowbridge, California, RTTY station of E. M. Lenn. Exciter: HT-32B; Receiver: SX-115; Terminal Unit: CV-89 of AN/URA-8A; Final Amplifiers: HT-33A driving a pair of 1000-T's in grounded-grid; Antenna: 3 elements on 20, 2 elements on 40; 65 foot crank-up tower; Teletype: Model 15 and Model 14 Typing Reperforator and Model 14 TD.

nels" now in use all over the country.

Let us look at consideration No. 1: Most of the old a.m. nets in operation are experiencing difficulty as band occupancy has increased. The old SCR-522, *etc.*, sets are found to be too broad, and an attempt to use some of the newer commercial amateur transceivers has been without complete success. Many of these sets have tunable receivers, lack stability, and don't have squelch. And they are just not made for continuous duty, unattended. Those who have seen the light and changed over to the wide band commercial surplus f.m. sets have been amazed at the increase in performance, such as range, stability, squelch, *etc.* The *FM Net Directory* published by K4ZAD shows quite a few f.m. RTTY nets already in operation in Chicago, Detroit, Cleveland, Milwaukee, St. Louis, and in Indiana. There is a definite trend towards the use of f.m. for this kind of extended coverage fixed-frequency operation. Considering the above trend, it is suggested that only one primary national channel be listed for RTTY. If a.m. is in widespread use in a particular area, why not continue to use it, unless adjacent channel QRM, BCI (rectification), or some of the other problems suggest a change.

Looking at consideration No. 2: It has been our sad experience in both the midwest and in the east that CD radio people, already operating 2 meter fone nets set up for RACES, do not wish to use amateur RTTY, preferring to either do without Teletype for budgetary reasons or to lease machines and landlines from the local telephone company. It also has been noted that CD drill operations, within the RACES boundaries, pre-empt those frequencies. Also, the fact that 40F2 cannot be used would prevent the more effective wideband f.m. equipment from being used on RTTY under RACES Rules. On the basis of the above observations it seems more practical to select a national RTTY frequency *outside* of the RACES segments.

Consideration No. 3: An in-band repeater system is not easy to set up or to use. Cross-band repeater systems, 6 to 2 for example, have been found quite practical and easy to use. It is therefore suggested that the selection of a secondary 2 meter frequency be done on a local basis, depending upon the situation in that particular area.

Consideration No. 4: RTTY nets known to b operating *outside of RACES segments* are 146.70 Southern N.J., a.m.; 147.40 Detroit, f.m 147.70 Chicago, f.m.; 147.85 California, a.m At this point we would like to remind you tha the Novice and Technician part of the 2 mete band runs from 145.0 to 147.0. Since man Technicians are interested in RTTY, it seem very logical to pick a channel that they can use too. Considering the above, avoiding the RACE bands, and the desirability of getting as high a possible to avoid QRM; this all suggests that w pick a frequency as high as possible without go ing above 146.79. Discounting random opera tion, 2 meter channels on f.m. have been set up with a 60 kc separation. (See the *FM Net Directory* for the reasons for this.) Many a.m. nets observe this same unofficial "channeling" as i makes good logic in band utilization. (RACES frequencies are set up on a 30 kc basis, many o which coincide with the 60 kc channels.) Channels then, starting at the top, are: 146.76, 146.70 146.64, 146.58, 146.52, 146.46, *etc.* Considerable fone activity exists in California on 146.76 146.70 has some limited fone activity in Michigan (besides the Southern N.J. RTTY net) 146.64 has a fone net on it in Los Angeles, 146.58 is used in the New York area to repeat f.m. fone to 146.94, 146.52 is a Long Island a.m. net frequency, and 146.46 is used in the Schenectady area to repeat f.m. fone to 146.94. Going lower gets us into more and more random a.m. activity, especially Novice and Technician activity.

Suggestion

Carefully considering all of the factors detailed above, it appears that 146.70 mc is the logical choice for a national RTTY frequency on 2 meters. It is therefore proposed that we obtain comments from Mr. Ed Handy W1BDI, Communication Manager of the ARRL, and leaders in the organized RTTY societies and groups across the nation, such as W2JAV, W3DTH, W4RWM, W5KXD, W6AEE, K6ESZ, W7WWG, W9SPT, WØATM, and WØJHS. Your monthly RTTY Column will be happy to serve as a clearing house for comments.

Corrections

In the November 1962 RTTY Column, the schematic diagram of the W2JAV Selector Magnet Driver shows the two Zener diodes, CR_5 and CR_6, connected in series. They should be connected back to back. In other words, reverse CR_6.

In the December 1962 RTTY Column, in the schematic diagram of the W2JAV Dot Generator, a ground symbol was left off the collector of transistor Q_1.

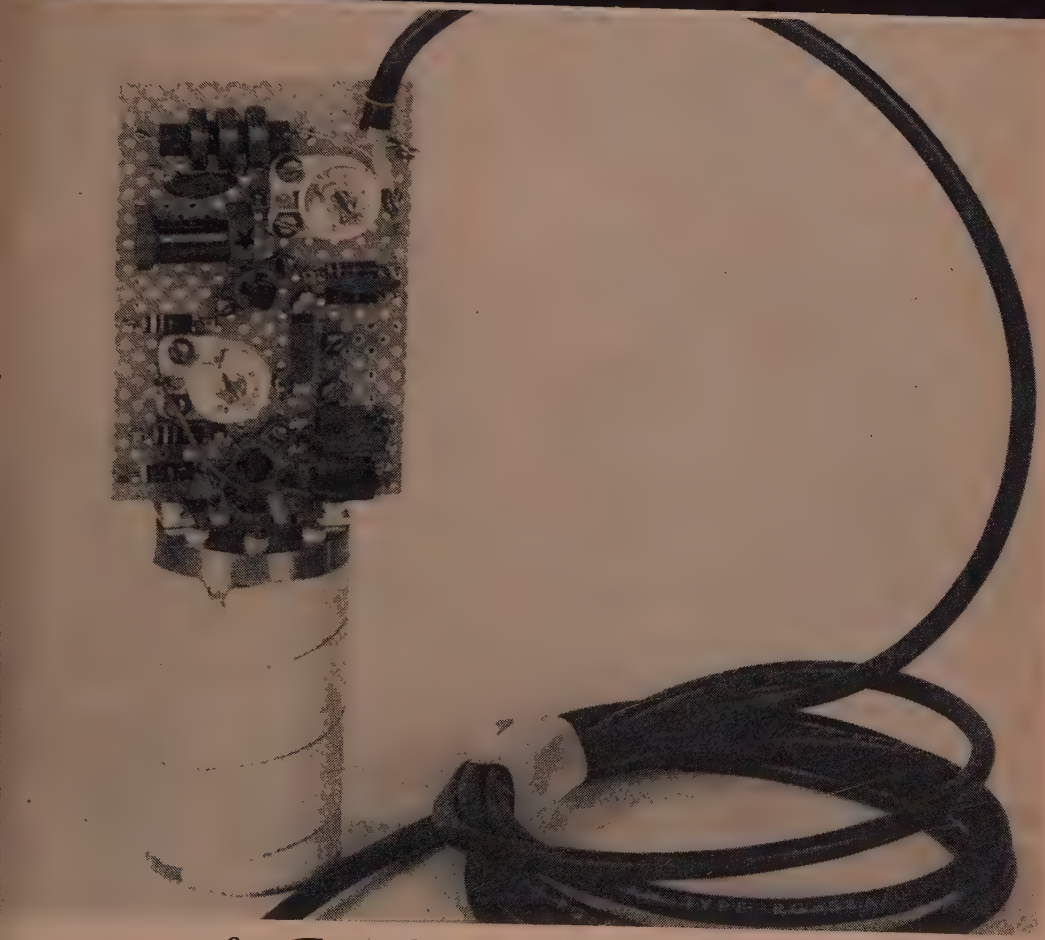
Column Comments

Next month we hope to be able to give you a run-down on the 7040/7140 business. Tune in, will you? Oh yes, we *do* have printed circuit boards for Project DESPAIR. See the January 1963 RTTY Column for the details.

73, Byron, W2JTP

Vol. 5, No. 3—March 1963

VHF AMATEUR



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Address correspondence to: Bob Brown, K2ZSQ, Editor, *The VHF Amateur*, 300 W. 43rd St., New York 36, N. Y.

Come up out of the noise . . . let 'em know you're around with a new 60 Watt **Clegg Thor** 6 Transceiver. Sound good? Here's the rest of the story.

TRANSMITTER FEATURES:

- **FULL 60 watts input on phone or CW to 6883 final.**
- **BUILT-IN VFO that automatically tracks the receiver or switches to crystal control for fixed frequency operation.**
- **ALL stages broadbanded for easy QSY.**
- **SPEECH-CLIPPING FOR MAXIMUM talk power.**
- **BUILT-IN PUSH-TO-TALK.**
- **BUILT-IN Keying relay for clean chirpless keying.**

MOBILE OPERATION

Now you can run a mobile "power house" using your new **Thor** 6 transceiver and model 418 transistorized, mobile modulator/PWR Sup.

RECEIVER FEATURES:

- **NUVISTORIZED front end for extreme sensitivity at lowest noise level.**
- **CRYSTAL lattice filter for maximum selectivity.**
- **BFO with variable carrier injection for SSB reception.**
- **ULTRA-STABLE tuneable local oscillator that also functions as VFO for transmitter.**
- **EXCELLENT audio characteristics. 2 watts into 3.2 ohm speaker.**
- **Sharp reduction in spurious responses and cross modulation.**
- **Effective noise limiter.**

The **Thor** 6 is of two unit construction . . . The Receiver—RF unit for convenient desk top operation and the modulator/pwr. sup. unit may be located remotely by a 10' interconnecting cable (provided).

Amateur net price for AC operation $349.95.
12V DC Mod./Pwr. Sup. $100.

COMING IN APRIL - SSB - ***THE VENUS 6***

Clegg

See your Distributor or write for information.

LABORATORIES
DIVISION OF TRANSISTOR DEVICES, INC.
RT 53, MT. TABOR, N. J.
OAkwood 7-6800

For further information, check number 49, on page 110

VHF Contest

I. CONTEST PERIOD

Total contest period is twelve hours, starting a 9 A.M. local time on Saturday, March 16, 196 and ending at 9 P.M. local time that same evenin (March 16).

II. BANDS

Any single amateur band, 6 meters and up. Thi is a single-band *only* contest. Any number o operators may work together under one call.

III. COMPETITION

Only single band entries accepted. *Separate* en tries will be accepted from the same station i both the 6 and 2 meter categories, however.

A. 50 mc only.
B. 144 mc only.
C. 220 mc only.
D. 432 mc only.
E. Club Aggregates: In addition to enterin in any of the above competition, a clu member may mark his log with the nam of the club he belongs to for a club ag gregate listing. All club member's score are added together to arrive at final clu aggregate total.

IV. EXCHANGE

The on-the-air exchange shall consist of th county, state, handle, contact number (prefer ably starting with 001) and signal report.

V. CONTACT POINTS

Each completed contact with a new station dur ing the contest period scores one point. Dupli cate and one-way QSO's do not count. "Mobil in motion" contacts count only as contact points *not for county multiplier.*

[*Continued on page 82*

V.H.F. CONTEST

NAME Robert M. Brown CALL K2ZSQ
ADDRESS 67 Russell Avenue
CITY Rahway ZONE — STATE New Jersey

BAND(S) OPERATED (circle) (50) 144 220 432 1296

Scoring

Number of contacts 200 X Number of counties 47
X Number of hours 12 X Power multiplier 3
TOTAL SCORE: 338,400

This is to certify that in this Contest I have operated within the limitations of my license and observed the rules and regulations of the contest.
Signature Robert M. Brown Call K2ZSQ
Signature Call
Signature Call

Return this log form as soon as possible to: The VHF Amateur Contest Committee, 300 West 43rd Street, New York 36, N.Y. An accompanying letter and photograph would be much appreciated by the group.

Date	Time In	Call	County-State and Handle	Numbers Sent	Numbers Rcvd	Report Sent	Report Rcvd	Time Out
3/16	0900	WA2BUP	Bergen, New Jersey	KEN	001	002	59	59
	0902	WA2QSO	Camden, New Jersey	DICK	002	001	56	57
	0905	WA2WJL	Monmouth, New Jersey	PAUL	003	001	58	58
	0906	WA2AAN	Westchester, New York	DON	004	003	59	59
	0906	WA2RPN	Queens, New York	HOWARD	005	007	57	58
	0906	WA2QFC	Union, New Jersey	SILIM	006	010	59+	59+
	0907	WA2QFJ	Union, New Jersey	DAVE	007	008	59	59+
	0910	K2YVE	Richmond, New York	PAUL	008	004	59	57
	[illegible]	[illegible]	Bucks, Pennsylvania	DAVE	[illegible]	001	59	59
	[illegible]	[illegible]	Westchester, Pennsylvania	DAVE	[illegible]	007	59	58
	0916	[illegible]	[illegible]	BOB	[illegible]	006	59	[illegible]
	0917	K2ZSQ	Kings, New York	[illegible]	009	[illegible]	[illegible]	[illegible]
	0917	WA2UIH	Bergen, New Jersey	CHARLIE	009	009	59	58
	0918	WA2EAO	Union, New Jersey	RON	010	019	59+	59+
	0920	K2BOW	Union, New Jersey	KIRK	011	016	59+	59+
	0923	WA2FVP	Union, New Jersey	WALT	012	018	59+	59+
	0924	W2NXT	Kent, Delaware	JAKE	013	003	56	56
	0926	WA2PKI	Suffolk, New York	FRANK	014	011	59	59
	0927	K2WJD	Burlington, New Jersey	BOB	015	024	59	59
	0928	K1PVK	Fairfield, Connecticut	PETE	016	013	56	57
	0929	WA2UEB	Westchester, New York	JOE	017	028	57	59
	0930	WA2QEO	Nassau, New York	DICK	018	019	59+	59+
	1002	K2YZA	Nassau, New York	FRANK	038	017	56	57
	1004	K2NDA	Queens, New York	DICK	040	045	59	59+

Sample log form properly filled out. These sheets ar available from *The VHF Amateur* office. Send s.a.s.e

A VHF Amateur Exclusive:

SIDEBAND ON SIX

ROBERT HEIL, K9EID*
402 Border Street
Marissa, Illinois

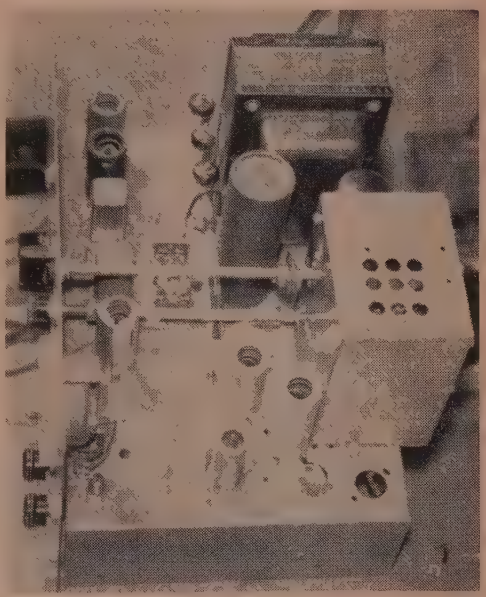
K9EID presents us with a complete 50 mc single sideband transmitter, equipped with its own modulator and power supply. If you're in the market for an inexpensive low power rig, this is it.

ONE evening I was invited to have the honorable "eyeball QSO" with Bill Hamilton, K9SFX, and was amazed at the little six meter exciter that he had built. Most v.h.f. sideband construction articles are centered around mixers that require a low frequency sideband exciter to drive them. Here the price gets a little out of hand if you want to hold the monthly budget down below the XYL's quota! Bill's complete 6 meter sideband rig is ready to go. Plug in the microphone and antenna, push the button and talk — you are on sideband. Easy!

Close observation will tell the story of the different sections and performance of the various tubes and components. The audio section uses a B&W 2Q4 phase shift network that is available on most distributor's counters. It is installed in the grid circuit of V_3. R_3 is the audio balance potentiometer that is used to align the audio network. The plate circuit of V_2 is coupled by a 2-turn link through the two 270 mmf silver mica capacitors to the carrier null controls, R_4 and R_5. The output of L_3 is coupled by a 1-turn link to a 4-turn link on L_4, which is in the grid circuit of V_4 (a 6AU6 buffer). The 9 mc sideband signal is fed to the cathode of the mixer V_5, a 12BY7A. The 6U8A, V6, feeds the grid of V_5 with a 41 mc signal which mixes in V_5 and produces a 50 mc sideband signal with a nice supply of 41 mc signal so it is a *must* that L_7 a 41 mc trap, be installed and used. This output drives a 2E26 final, which is in class AB1. At K9SFX rock-bound operation was used for some time but later a variable crystal oscillator was built and worked very successfully. It plugs into J_3 which drives the 6U8A (V_6), then it is amplified while being fed to the mixer (V_5), just as the crystal frequency of 41 mc was. The vxo will not be described at this time. It is not necessary for operation if a 41 mc crystal is used.

Construction

Before you run out and heat up the iron, it should be suggested that you sit down and read the *CQ SSB Handbook* and several articles in back issues of *CQ* that were used as a guide for some of the design of this sideband transmitter. The audio section was taken from an article by Tucker and Copeland in the August 1960 issue. The phase shift network is the "ZL" type from Ernshaw's article in November, 1959. This will give you a more of an explanation of how it works.



Top view of transmitter. The 2E26 is in the box on the back of the chassis. Push-to-talk relay can be seen under the extension sheets for the plate and load of the 2E26.

The chassis used on the pilot model was 8×12×3". This fits into a Bud SB-1810 "shadow box" cabinet very nicely. Holes were drilled into the top and bottom of the "shadow box" so that a bit more circulation of air would be possible. Heat is a prime factor when drift is encountered. Drilling these holes cured these excess heat problems.

The 9 mc exciter audio and r.f. section is along the front edge of the chassis. The audio is fed in the left end and the 9 mc s.s.b. is produced at the right. The 2E26 final is in the small compartment on the back edge of the chassis. The plate and load capacitors are tuned from the front panel by means of long extension shafts on these controls.

*Unit designed and constructed by Wm. Hamilton, K9SFX, Route 1—Box 234A, Columbia, Illinois.

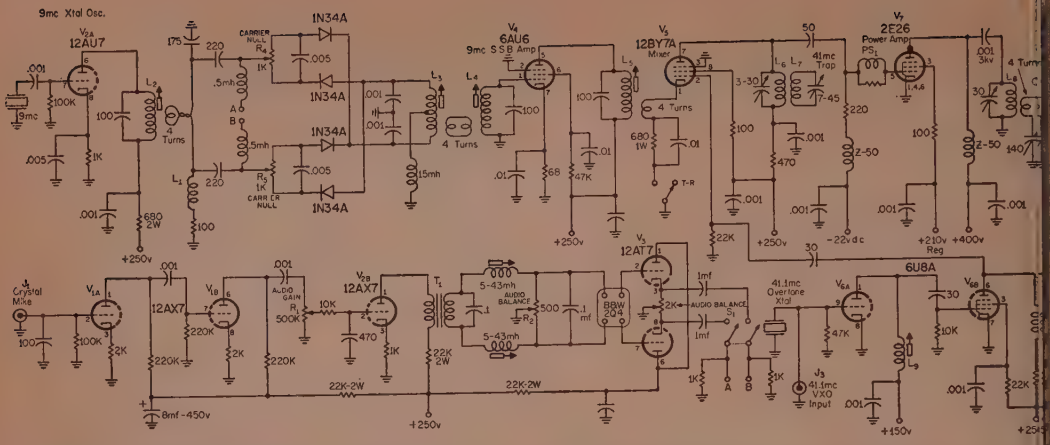


Figure 1—Schematic diagram of K9SFX's 50 mc s.s.b. exciter. All potentiometers (except the 500K audio gain control) are 2 watt. 1N34A diodes should be matched (measure forward resistance with ohmeter).

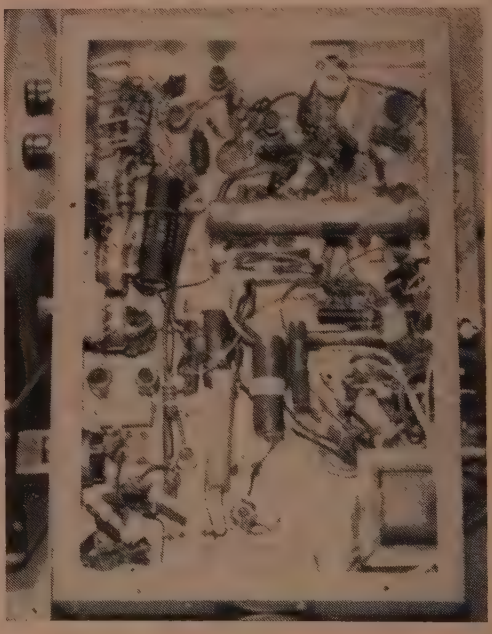
L_1—8 t. #18 e. ¼" dia. No form.
L_2—20 t. #26 e. ⅜" dia. slug tuned form.
L_3—8 t. #18 e. ⅜" dia. slug tuned form. 1 turn link wound on center.
L_4—20 t. #26 e. ⅜" dia. slug tuned form, 4 t. link hookup wire on cold end.
L_5—Same as L_4.
L_6—6 t. B&W 3003 (½" dia., 16 t.p.i.).
L_7—10 t. hookup wire, one t. in cold end of L_6, ½" closewound.
L_8—5 t. B&W 3010 (¾" dia., 8 t.p.i.).
L_9—10 t. #26 e. ¼" form, slug tuned.
L_{10}—10 t. #26 e., ¼" slug tuned form.
PS_1—47 ohms, ½ w., 3 t. #26.
PS_2—100 ohms, 1 w., 3 t. #18.
SW_1—DPST (sideband change).
T_1—Lionel surplus TF1A19 (W2EWL type).

Seen under the control shafts is the push-to-talk relay, which is used to key the bias and the coaxial antenna relay. This can be wired to suit the individual station needs and could be used in conjunction with a vox circuit if you desire a voice controlled relay system. In order to keep the budget down, the luxuries of the vox was substituted with a push-to-talk system.

The power supply was taken from an old television receiver that was salvaged from the local TV repairman. This supply gives 150 volts regulated from the OA2, the 250 volts for the plate circuits, and the bias voltages and the filament supply. The bias voltages are taken from one side of the secondary through the two voltage dividers, a 68K, 2 watt and a 27K, 2 watt resistor. This voltage is then rectified by a 100 ma selenium rectifier. The bias for the 2E26 is taken from the arm of the bias control potentiometer R_8. The screen voltage of the 2E26 is taken from the pair of OB2 regulators. Needless to say, care should be taken to bypass all the filament leads and make sure they are at a good ground where shown.

Be sure you wire the tube sockets *before* installing them along the front edge of the chassis. It is a little hard to get into the corners with a soldering gun so mount as many of the components as called for on each of the sockets and then install the socket assembly. This works very well and the components are not over heated while trying to solder them inside the chassis.

Care should be exercised to see that all solder connections are not sloppy and are heated suf-



Bottom view of exciter showing placement of components.

(9SFX's s.s.b. exciter, v.x.o. and 4X150 final amplifier. Exciter controls on the front panel left to right: microphone, audio gain, audio balance, (behind hole plugs), sideband selector, carrier null, A and B. Antenna loading and plate "tune" are above the audio balance potentiometers.

ciently to give a good hot solder connection but ot enough to burn the components by overeating.

Tuning Up

After careful examination shows that all parts ave been mounted and connected, the tune up rocedure begins. First make sure that $SW_{2a\&b}$ turned to the off position or, if you have used push-to-talk relay, it should be in the "off" osition. Apply 110 v.a.c. to the power supply nd watch for all filaments to become lit. After his is accomplished, you are ready to begin lignment procedure.

Begin by listening on the station receiver to mc. As you key the transmitter (SW_2) a signal ill be heard on 9 mc. Tune L_2 for maximum utput. Then adjust R_4 and R_5 for minimum arrier. The carrier can be nulled completely ith careful adjustment. Now turn R_5 so that ome carrier is heard in the receiver. Adjust L_3 or maximum 9 mc output. With R_5 still "unalanced," adjust L_5 for maximum 9 mc output. nce again balance out R_5 so that no carrier is etected. Note that there will be some residual arrier that will not be heard over the air. At his point take the grid dip oscillator in hand nd, if you have a receiver capable of tuning 1 mc, tune it on frequency and begin the alignent of the 41 mc oscillator, V_6. Tune L_9 and $_{10}$ for maximum 41 mc output on the GDO or eceiver. When this is finished, you should be ble to hear a signal on 50 mc. Unbalance R_5 gain and listen for a signal on 50 mc; while stening to this, take the grid dip oscillator ned to 41 mc and couple it close to L_7 the 1 mc trap. Tune the ceramic trimmer until *inimum* 41 mc. signal is shown on the meter. une the PLATE and LOADING controls on the final resonance with a good 50 ohm dummy load. his completes the r.f. alignment.

Tune the receiver to 50 mc and listen for the gnal. Make sure the CARRIER NULL potentioeters are balanced out. Now hook in a 1000 cle oscillator tone to the MICROPHONE jack, J_1.

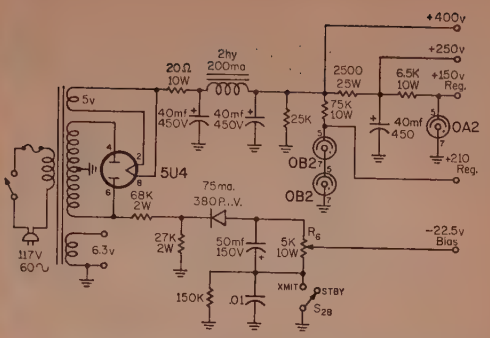


Figure 2—Power supply circuit for the 50 mc s.s.b. exciter. Most all parts have been salvaged from old TV set.

Turn the AUDIO GAIN about one-quarter open (R_1). Adjust R_2 and R_3, the AUDIO BALANCE controls, for minimum modulation in the receiver with the A.V.C. on, B.F.O. off, and the antenna removed, so as not to overload the front end. Adjust L_{20} and L_{21} for the minimum modulation. Switch the SIDEBAND position on SW_1 and adjust these four controls again. Try to get both sidebands to have equal modulation characteristics in the receiver. If most of your operation will be on the upper sideband (and 97% is), adjust the four BALANCE controls for minimum modulation of the 1000 cycle tone in the receiver. A compromise can be reached for both and will be very satisfactory.

This alignment works well, but, if you can acquire a good oscilloscope, the sideband suppression and ripple can be adjusted better. The *CQ Single Sideband Handbook* or the *Radio Amateur's Handbook* will give complete information on setting up the 'scope and will explain the alignment if you are not familiar with the use of this instrument.

With align procedure out of the way and everything performing correctly, this 6 meter sideband rig is ready to mount in the cabinet and be put on the air. Results at K9SFX were very rewarding with the little rig as compared to the old a.m. transmitter that Bill had formerly used. Yet, with less than one-quarter of the former power, anything that was worked with the big a.m. rig was worked as well, and sometimes better, on sideband. Distances of over 300 miles during normal conditions have been worked with this exciter. Needless to say, on some sporadic-E openings Bill has talked with Mexico, Canada, and the four corners of the U. S.

Bill has since built a final for the rig (which is shown in some of the pictures) which uses a 4X150A housed in a very small cabinet outboard on a separate chassis. This increases the "talk" power to up about 300 watts, which helps to make K9SFX quite a bit louder. Of course, this is strictly a luxury and can always be added. This transmitter has proved to be quite successful and it has been in use for over one year at this writing. ■

Stable Crystal Oscillator for 1296

BY JOHN E. LINSE*, K2HAC—AFA2HAC

Many u.h.f. enthusiasts contemplating operation on the 1296 mc band have run into the rather serious problem of frequency stability in the receiver and transmitter. This simple transistorized circuit provides an excellent solution.

AFTER a year of building and rebuilding equipment for my 1296 mc moon bounce project, it was realized that stability in the receiver local oscillator and transmitter multiplier chain was of prime importance.

Frequency stability must be greater than 1 part in 10^{-8} since the crystal oscillator frequency is multiplied 162 times to reach 1267 mc, my receiver local oscillator and transmitter mixer frequency. A block diagram of the multiplier chain is shown in fig. 1.

An oscillator circuit utilizing vacuum tubes and a good crystal oven was built. The long term stability was excellent but short term stability was poor. This condition was finally attributed to the crystal oven temperature cycling. The final solution to the frequency stability problem was to disregard all previous oscillator circuits and build a stable transistor oscillator without inductors in the oscillator circuit.

When frequency stability is of prime concern, a phase stable amplifier and a high quality resonator (crystal) should be connected in an optimum manner satisfying output voltage and waveform requirements. Capacitors are used for impedance transformation between amplifier and resonator. Frequency stability is degraded when power is required from the oscillator since the load resistance will degrade the Q of the resonator or the coupling impedance.

Fig. 2 shows a simple Colpitts oscillator where the crystal is used in place of the inductor and series resistance. The feedback path is from collector to base and the value of C2 is carefully chosen so that the base is driven by a low impedance source. C1 and C2 are chosen to present the proper terminating impedance for the transistor. The collector capacitance is small and is stable with collector current but the input capacitance is large and will vary with current. Therefore C2 should be greater than C1 and each should be as large as possible and still have the circuit oscillate.

A grounded emitter buffer amplifier follows the oscillator to provide isolation from the load. It should be noted that the buffer is driven from the lowest impedance point of the oscillator. Frequency stability is enhanced by

Here's a view of the completed oscillator ready for action. RG-58A/U is used to couple the 8 mc output from the transistorized oscillator to the first multiplier stage.

*608 Stamford Drive, Neptune, New Jersey.

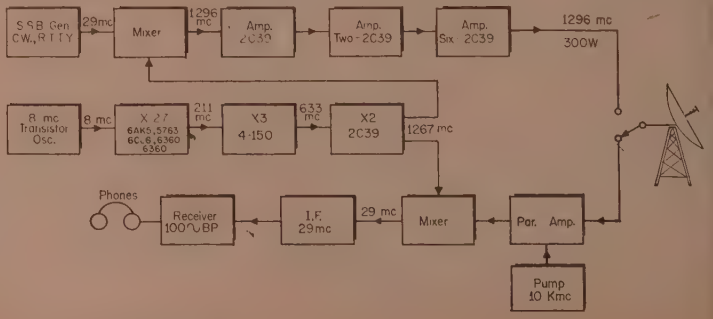


Fig. 1—Block diagram of K2HAC's moon bounce system for 1296 mc showing placement of the 8 mc transistorized oscillator (center, left).

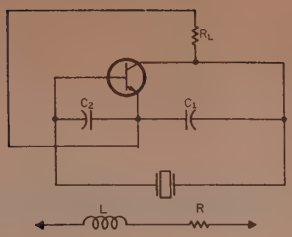


Fig. 2—Schematic diagram of a simple Colpitts oscillator, basic circuit used in the 1296 mc oscillator.

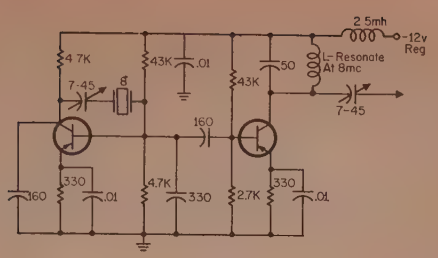


Fig. 3—Schematic diagram of K2HAC's transistorized oscillator circuit. Transistors that may be used are 2N396, 2N499, 2N247, 2N404, 2N1224, 2N1226. NPN silicons are recommended.

placing the oscillator and buffer circuit in a vacuum bottle filled with styrofoam.

Stability in the order of three parts in 10^{-9} may be realized by careful construction and proper temperature control. Various high frequency transistors may be used, but the NPN silicon type gave better performance.

The author wishes to thank Carl, W2AZL, for his kind suggestions and Bill, K2TKN, for his continual pressure which finally convinced me that this kind of article should be written. ■

Power Reduction on the Zeus

STAFF

Most VHF'ers probably recognize the Clegg Zeus as one of the most efficient high powered rigs on the air today. Running a 7034 (4X150A) in the final, the Zeus normally loads at a clean 185 watts with superb audio. Sometimes, however, it is convenient to run the unit at lower inputs, but simply detuning the final often produces many undesirable effects.

To lower the Zeus' power, a simple addition must be made to the power supply-modulator; that of a Powerstat or Variac (variable voltage transformer) to the plate supply. The Superior Electric Model 116 Powerstat chosen gave output from 0-140 volts with 120 v.a.c. input and was equipped with an a.c. line cord input and female a.c. socket at the output.

To install, the first step is to unsolder the two primary leads from transformer T_{301} to the terminal strip. To these leads attach a two-foot length of line cord with a male a.c. connector. Now solder a four-foot length of line cord with a female a.c. receptacle to the two terminals on the strip where the transformer leads were removed. Connect the Powerstat.

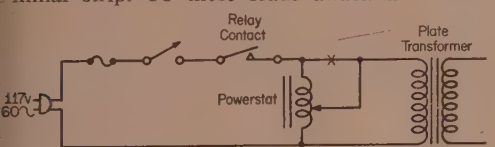


Fig. 1—Schematic diagram of the power control system as inserted in the Clegg Zeus. Wires should be opened at "X."

You're now ready for operation of the Zeus with a power range from 3 watts to 185 watts. The Powerstat has an ON-OFF switch that can be left on at all times, since no a.c. flows to the Powerstat unless the transmitter is turned on. *Be sure to reduce grid drive to the Zeus when low power is used;* two to three ma is sufficient for power inputs between 3 and 50 watts, 4 ma from 50 to 125 watts, and normal drive above this level.

The Powerstat simply controls the a.c. voltage at the primary of the power transformer (which supplies plate voltage for the final and modulator), thus varying the d.c. voltage to the final. The plate current is proportional to the plate voltage and a drop of primary voltage from 120 v.a.c. to 60 drops the resonant plate current from 200 ma to 100 ma.

To prevent audio distortion at lower inputs, reduce the AUDIO CALIBRATE control (R_2) at the rear of the r.f. chassis. Under these conditions, the modulation monitor light will no longer function, but the transmitter operates perfectly in all other respects. ■

ARC-5 v.f.o. for 6 meters? Dave Heller, K3HNP, told how in a detailed article with photographs in our September 1961 edition, still in print. *1296 mc crystal controlled converter?* Full schematic with front cover photo of K2CSM's 6U8-6AN4-6DJ8 converter with 26 to 30 mc output was presented in our October 1961 edition. *Complete APX-6 to 1296 mc amateur band* conversion data compiled by our UHF conductor, Allen Katz, K2UYH, appeared in our June 1962 issue. Enclose 35¢ for each desired (add two airmail stamps for faster delivery). Write: *The VHF Amateur,* 300 W. 43rd., N.Y. 36, N.Y.

VHF SSB

ROBERT HEIL*, K9EID

THE brisk winds of March are almost upon us and it's almost time to bring out that new antenna the XYL donated to the Christmas cause. What a thrill to get that new "squirter" up, pushing that sideband signal out a little further, all in time for the Spring sporadic-E sessions.

Six Meter Activities

. . . *K5IQL*—is getting ready for the season with a new 6 and 2 meter sideband rig built around the McCoy filter . . . *K5OMQ*—Roswell, N. M., is sharing the limelight with Frank as one of the very few sidebanders from that state . . . *W5SFW*—Phil is now on sideband with a Thunderbolt . . . *W5HVP*—Red, of Brownfield, Texas, is also on from the second largest state . . . *K9ZOO*—Gene, in Chicago, is running 1000 watts and is looking for some contacts . . . *K9HMB*—his neighbor, is running 800 watts to an 11 el. antenna. *What interesting results these fellows must have! . . . K8TRM*—informs us that the Grand Rapids, Michigan, area is graced with some new 6 meter s.s.b. calls: W9PCZ, K8NKE, and W8MRO . . . *W9HGE*—Bob Thomas is still at it; his daily contacts with Jim, WØPFP, at Ames, Iowa, have been about 90% reliable for over a year. *That's 252 airline miles.*

. . . *K8NIE*—Jim tells us that he's now running a new 4-250 into 12 elements on an 88 foot tower. Look for him! . . . *K2PCG*—Phil Gural, previous conductor of this column, informs us that he's still in college and the activity is nil at this time . . . *K9TFJ*—In Indiana is on 6 with a Heath SB-10 and transverter . . . *W5GKP*—New Orleans, is running 300 watts on 6 sideband . . . *W5BLE*—Barry completes the Dixieland's VHF s.s.b. activity, but reports that sideband progress is coming in that area.

. . . K6QXY and WA6MXI have *the* VHF s.s.b. station in the Bay area. The 130' Rohn tower consists of stacked 11 el. Spiralrays (36' long) for six, and 22' Spiralrays for two. Rig? An Eldico SSB 110F driving the h.b. mixer and a pair of 4X150A's. This goes into the p.p. W4UCH 450TL final (not yet completed) . . . *Word is out*—that the California group is on 50.110 mc upper sideband. Look for: K6YIL (OM of K6QXY), WA6FJX, W6BUR, W6JKN, K6UZK, K6KFF, WA6QEJ, K6HCP, W6FZA, etc. . . . *W6JKN*—Red is using a converted SB-10 driving it with a Gonset Communicator. How about more dope, Red? . . . *WA6IES*—has a new Heath HX-30 on, and the two meter section of

*402 Border Street, Marissa, Illinois.

It seems the "big gun" on 20 has turned to 2 me s.s.b! Meet Gus, K9EBA, with his newly-construct "SB-62," 100V and 51J3.

the "SB-62" (see p. 92, November 1962, *T VHF Amateur*) to put him on 144 mc s.s.b. . *WAØDZH*—Lon has a 10B, h.b. mixer, drivi a 4X250B to 300 watts . . . *K8TCL*—has sever a.m. ops building the '.SB-62," so I guess t Royal Oaks, Michigan, area will be on sideba shortly.

. . . *K4JQY*—Charlie has been working o well with the 4X250B's on 6 and the 4CX300A on 2. During December he worked K1PBE meteor scatter . . . *W6QMN, KB6CL/KH6*— on 50.102 mc upper sideband from Hawaii. Le make some skeds!

Two Meter Activities

From recent letters received per the two mete s.s.b. frequency, it seems that no particular spo has been arrived at nationwide. The St. Lou area uses 145.05 mc uppersideband. From Cal fornia, K6QXY, K6YIL, K6UZK, W6FZA, an W6NLZ, carry the 50 mc sideband ball, althoug there is no exact frequency is used throughou *Let's all try 145.05 on two meters, eh?*

. . . *WØLFE*—Ed has a new P&H 2-150 on th air and is really having a ball. It's driven by a HT-37 and pushed by a Thunderbolt. He's bee maintaining schedules with WØIUF, K7HKL and recently worked W7JRG . . . *WA2EMA*— Bill listed about 15 two meter stations active i N.J. on 2 meter s.s.b. He's running one KW t a pair of 4CX250B's in p.p. . . . *W3LST*—in O City, Pa., has a new sideband rig on; look fo him! . . . *WAØDZH*—Lon is running 300 wat to a pair of 4X250B's feeding his 13 element up 60 feet . . . *K4ZQM*—Gene (Alabama) ru about 800 watts to his 4X150A's feeding int

an 8/8 at 73 feet . . . *K1QGY*—Don, of Nashua, N.H., runs a 5894 on 2 meter sideband.

The HA-2 Hallicrafters transverters are making their appearance according to the mail. W9BYZ, K9OMQ, W4GWF, W9ENK, W9TOY, W9ONO, K9VUR, and W9JC all have them in use.

. . . *WA4AET*—Bill, in N.C., runs a 4-400 with a 20A mixer driving it . . . *W4SOP*—is ready to go with his new h.b. rig . . . *W4BUZ*—Don has his Eldico 100F driving a pair of 4X250B's . . . *K9SGD*—Joe, of Sparta, Illinois, has been heard with his 4X150 rig. He's looking for skeds . . .The W5's are finally getting their rigs on two meter sideband . . . *W5DZ*—at Waco, Texas, has the new P&H 2-150 on the air . . . *W5KFU*—of Dallas can be found on upper sideband with *W5FYZ* at Minden, La.

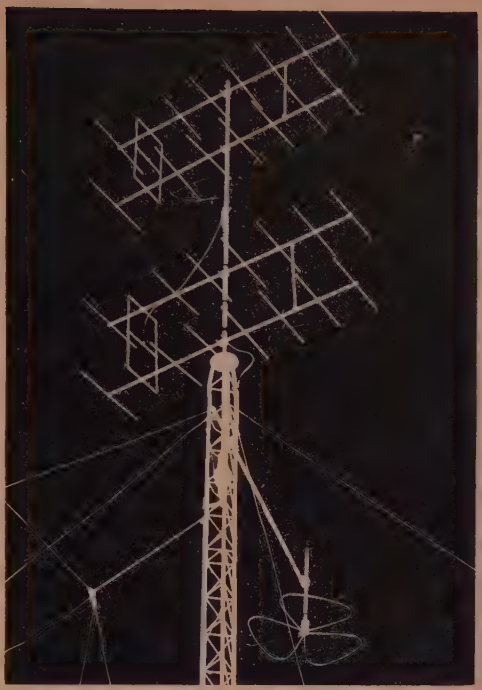
Sideband Multiplier

Are you planning to enter the Twelve Hour VHF Contest on March 16? Check the rules on page 70 this issue for our special sideband multiplier. Free logs upon request from *The VHF Amateur*, 300 W. 43rd Street. New York 36, New York.

First VHF SSB Transceiver—Clegg

The first commercially built VHF sideband transceiver has finally been introduced to the ever-increasing market of VHF equipment. This newest addition to the Clegg line has many features which will undoubtedly prove valuable to the serious minded sideband operator. The receiver oscillator becomes the transmitting v.f.o. on TRANSMIT, so that you automatically listen and transmit on the same frequency.

The rig runs 85 watts input on s.s.b., a.m., and c.w. Frequency coverage is any 500 kc segment between 49.7 and 52.0 mc. The unwanted sideband is down more than 40 db and the carrier is suppressed to 50 db. They claim that frequency stability is less than 1 kc warmup drift after the first five minutes. After this, it becomes 100 cycles per hour. The unit has 18 tubes in the 15 × 7 × 10½" case. It weighs 18 lbs. This ought to really boost six meter sideband activity!



The 32 element "J" array at WØLFE in Bowling Green, Mo., a fine two meter station that has been around for quite awhile. (Photo by Jos. Bryant of *The Bowling Green Times*).

QRT

Until the month of May rolls around, I will be busy getting ready for the next column. Keep those reports coming, as I appreciate your help in obtaining operating news. Hope the Spring weather comes along in leaps and bounds, so we can get those antennas up in time for summer openings!

73, Bob, K9EID

Rex Thomas, W9WQS, of Lafayette, Indiana, at his P&H 6 and 2 meter s.s.b. station.

The UHF

ALLEN KATZ*, K2UYH

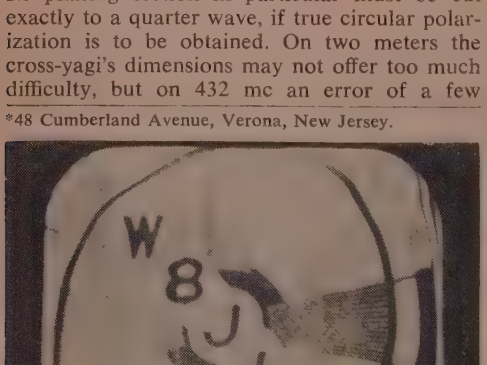
MARCH here already? The winter has sure gone by fast. I guess now that the ground is thawing out, a VHF amateur's thoughts cannot help but turn to his antenna.

For years the Yagi and the collinear antennas dominated the VHF-UHF bands. Larger array designs and novel feed systems had shown up occasionally in the ham journals. But nothing really new had come along. That was until a few years ago. Then amid the dying embers of the old horizontal-vertical polarization feud, an antenna which produced circular polarization (the helix) caught amateur enthusiasm. It was felt that circular polarization held the answer to overcoming the losses due to polarization shift (Faraday rotation) encountered in moon and satellite bounce communications. Later it was discovered that circular polarization also had certain advantages in long-haul tropospheric work.

More recently the cross-yagi antenna has become very popular. This antenna produces circular polarization by mounting both a horizontal and a vertical yagi on the same boom. Depending on how the vertical and horizontal parts are connected together, this antenna can produce either right hand or left hand circular, vertical, or horizontal polarization. This feature, along with the cross-yagi's smaller size, explains its present popularity. All is not peaches and cream, however. A cross-yagi's dimensions are critical. Its phasing section in particular must be cut exactly to a quarter wave, if true circular polarization is to be obtained. On two meters the cross-yagi's dimensions may not offer too much difficulty, but on 432 mc an error of a few hundreds of an inch can ruin the antenna's performance.

What is the answer for the UHF operator? Possibly it is the helix. This antenna is probably the most non-critical hi-gain antenna ever devised by man. It has a two-to-one frequency range. Besides this, it is very likely that the helix can be made just as versitile (polarization wise) as the cross-yagi. Already in industry methods have been devised to obtain linear polarization from two stacked helixes. Other arrangements similar to the cross-yagi have been suggested. Why not give the helix a try? If you want further technical information or come up with something, be sure and drop us a line.

*48 Cumberland Avenue, Verona, New Jersey.



Test pattern received at W8RQI of W8JLQ's ham TV broadcast on 432 mc. We hope to have more pictures and a story for next month's column.

Mailbag

APX-6 operators meeting planned for April at K2RGF QTH:

"The APX-6 operators meeting we mentioned last month is definitely *on*. The group (we now have a name, The Central Jersey UHF Net) got together and we decided on April 8 for our meeting. I hope this date is okay with everybody." *Bob and I will be there, 1220 mc mobile.* "The address is 17 Baldwin Road, Edison, New Jersey. I will be glad to answer any requests for exact directions or further information. Things should get rolling about eleven o'clock. Let's not have anyone forget their APX-6's. We all want to be on the same frequency."

Al, W4LSA, reports on ham TV in Tucson, Ariz.:

"We had a pretty good ham-TV setup back in Florida with an ATJ camera and associated gear. During the weekends I used to transmit a test signal between 11 and 12 noon from my 11 element Cushcraft beam. Received good off-the-air pictures from my monitors. But due to selling our property, I had to tear the whole setup down. I am now in Arizona to see if the new address will do my sinus condition any good. Will probably be on the air with a ham TV signal before I get my other gear setup. Will let you know if I can generate any interest here." *Good luck on the new QTH and in getting the ham TV ball rolling. Arizona is most fortunate in having you for a resident.*

W3BJG on UHF doings around York, Penn.:

"We are active on 50, 144, and 220 mc. On 220, we operate a homebrew 6360 transmitter running 15 watts input. The receiver is a 417A converter into a HQ-129X, and the antenna, a 12 element collinear.

220 and Up

Vince, K4DAO/4 and Sam, K4PXC, at Vanderbilt University in Nashville, Tenn., have recently acquired two APX-6's and are in the process of modifying them. They say that they're learning a lot from their first crack at UHF. Can anyone in the area give them a sked? *Fellows you might try getting in touch with W4VSN or W4SGI who are on 1220 mc with APX-6's from Oak Ridge, Tenn.* Steve, K8VII, located in Benton Harbor, Mich., is starting a unit for 432 mc and hopes to be on soon. *Steve, when you do get on 432 mc you should have no trouble making your first QSO with Jack, W8PT, on 432 from your own home town.* W9JFP, Vic, sends word that he and K9DOE of Forest Lake, Ill., are building 1 kilowatt finals and 416B coaxial tank converters for 432. Bob, K9CGD is also getting setup for the increase in 432 mc activity due to the power rise. Bob will be on with 1 k.w. to a pair of 7457's in coaxial cavities, a parametric amplifier, converter, and a 22 element beam. *More results of the recent power increase should be coming in soon.*

W6BLK, San Diego, California: Don has gear for all UHF bands, 1296 mc and down. On 1296 and 432 mc, skeds are conducted every Saturday and Sunday morning with WA6HIT in Pacific Palisades, approximately 120 miles away. A 2C39 crystal controlled transmitter running 20 watts, crystal controlled converter into an NC-183D and a 4 foot Dish are used on 1296. W6BLK's 432 mc equipment consists of a transmitter with a 5894 final at 50 watts input, a 6AN4-6AN4 crystal controlled converter, and a long-john Yagi antenna. Don also mentions that he has worked WA6HIT with an APX-6 on 1230 mc. *That is some contact for an APX-6; how about some more details in the future?* On 220, the rig is a 6360 transmitter running 10 watts, a grounded grid 6AJ4 converter into an SX-100 receiver, and a six element beam, vertically polarized. Other stations active on UHF in the San Diego area are W6's GTZ, CMQ, WCH, and KD.

W9OVL, Hammond, Indiana: Ben sends in an impressive list of 220 mc QSOs he made in the month of December. WA9FLV, K9DNG, W9RPF, and K9OOK are among the stations listed. During December Ben was heard 59 for one half hour by WØYZV in Omaha, Neb. on phone. *Quite a haul for 220 in the Winter!* Stations west of Chicago look for W9OVL on Monday, Wednesday, and Friday between 2000 and 2100 hours CST.

W6AJF, Sonoma, California: Frank is active on 432 mc on Sunday nights at about 2230 hours PST. It is at this time that he holds skeds with W6NTV, Turlock, Calif. 432 mc gear used consists of a crystal controlled transmitter with a screen modulated 4X150A final, nuvistor converter into homebrew i.f. strip, and a 32 element collinear. A paramp is also used occasionally.

73, Allen, K2UYH

the VHF TWINS

MODEL 6-150 SIX METER TRANSMITTING CONVERTER

Converts the 20 meter output of your SSB, AM or CW exciter to 6 meters. Power input to 8117 final; 175 watts PEP on SSB, 165 watts CW, 90 watts linear AM. Resistive pi-pad permits operation with any 10 to 100 watt output VFO or crystal controlled exciter. Meter reads; PA grid, PA plate, Relative output. 50-70 ohm input and output. Quiet forced air cooling. Modernistic, recessed panel cabinet 9" x 15" x 10½".

COMPLETE WITH BUILT-IN POWER SUPPLY, TUBES AND CRYSTAL $299.95*

MODEL 2-150 TWO METER TRANSMITTING CONVERTER

The MODEL 2-150 converts the 20 meter output of your SSB, AM or CW exciter to 2 meters. Resistive pi-pad permits operation with any 10 to 100 watt output exciter, either VFO or crystal controlled. Power input to 7854 final; 175 watts PEP on SSB, 165 watts CW, 90 watts linear AM. Meter reads PA grid, PA plate, Relative output. 50-70 ohm input and output. Quiet forced air cooling. Modernistic, recessed panel grey cabinet, 9" x 15" x 10½".

COMPLETE WITH BUILT-IN POWER SUPPLY, TUBES AND CRYSTAL $329.95*

*Slightly higher West of Rockies

WRITE FOR INFORMATION

P & H ELECTRONICS INC.
424 Columbia , Lafayette , Ind.

For further information, check number 12, on page 110

DX report

DANIEL L. PARNES*, WA2DMQ ROBERT M. BROWN*, K2ZSQ

INTERESTED in snagging rare DX and extending your working radius? These next few months might be just the ticket. From all indications it looks as if participation in the two VHF contests just ahead might well break all previous records. First, we have *The VHF Amateur's* Twelve Hour VHF Contest on March 16. This is followed by the all new Spring *CQ* Worldwide VHF Contest on the weekend of May 4-5. These two competitions are sure to bring out the mountaintoppers as well as some of those elusive rare-area stations who seem never to be heard when you need them most.

50 Mc News

W2: WA2GWM (N. J.) found the band very good on Dec. 22. Frank worked WAØANP in Neb. for a new state. Other openings were reported on Dec. 15, and 20, to the Midwest. K8RXT/9 (Mobile) hooked Frank for an unusual mobile DX contact. WB2CGQ, Long Island, N.Y., worked W8AK (Mich.) via short skip during the Nov. 30 opening.

W3: Long haul groundwave made up the day's activities for W3HCW, Williamsport, Pa., on Nov. 15 and 17. Some of the stations contacted were W2EWM (Windsor, N.Y.) and W1FVT (Dalton, Mass.).

W4: K4YDG, Roanoke, Va., reports skip on Dec. 4, and 27. On Dec. 4, Glenn worked VP7CX and on the 27th, KØMSS, Omaha, were worked. Openings in Lynchburg, Va., from W4TZI have been good during Dec. States coming into Va. recently have been Ga., Miss., and Tex. (on the 4th). On Dec. 3, WA4IRX (Memphis) worked CO2GS, Havana.

W5: From Trinity, Tex., WA5APU reports working skip into Ohio on Dec. 5th, Mich. on Dec. 20th and N.J., on Dec. 21st. W5PVT (Andrews, Tex.) worked the very-popular VP7CX on the 1st of Dec.

W6: W6BUR (San Francisco) worked K6OLP (Sacramento) on ground wave on Dec. 9th.

W8: K8BQJ of Saginaw, Mich., reports working on Dec. 5, WA4HLD (Tampa) and on Dec. 20th, K5ZIQ (Baton Rouge). W8PT of Benton Harbor, Mich., worked WØIUF (Boulder, Colo.) on Dec. 14th and heard W2's, 8's, 9's, 3's, and one W4 during the aurora.

W9: From Granite City, Ill., W9BLZ caught openings on Dec. 5th and the 20th. The Dec. 5th opening was to Tex., and Fla., and on the Dec. 20th opening was to Mass. and N.Y. Many other states were heard but not worked. On Dec. 20th K9EID worked a slew of W2's, and W1's.

WØ: WØGXJ, Cedar Rapids, Iowa, worked W5GXJ in Dallas. From Mo., on Dec. 20th KØFPC worked WB2EXG under heavy QRM conditions.

Two Meter News

Illinois: *K9DTB*—reports nice 170 mile QSOs with W9POS and W9ACL, both in Cayuga, Ind., on Dec. 2. Phil, of Villa Park, also snagged K9OVR and WA9DOT with his wide-spaced 10 elements, up 40 feet . . . *K9RVG*—of Chicago has been busy with W8YIO, K8SRE, K8TCA, W9DHQ, and W9BVP. W8YIO represents 270 miles . . . *K9CGD*—North Riverside, uses an indoor 10 element Yagi, up 15 feet. Bob reports missing "all the good ones . . ."

New York: *WA2VBX*—Rocky Point, upstate. Mike writes, "No DX this month, but I've now got a beam up, so look out!" He did snag W1BU and W1YQI with a dipole and Twoer, though . . . *WA2LRO*—Dick, of Great Neck, caught K3VMW, just 10 miles north of Baltimore, on November 30. Sigs 54-59 . . . *Stop the presses!* Just got a quick note from WA2VBX reporting QSOs with K2RRM and WA2JNA (N.J.) with that new beam. Mike heard W1KSI (Vt.), but no luck yet.

New Jersey: *WN2EIE*—Bob Barth, of Verona, is looking for schedules to New England during the week.

73, Dan, WA2DMQ
Bob, K2ZSQ

**The VHF Amateur*, 300 W. 43rd St., New York 36, N.Y.

Commercial Broadcast station? . . . No. Those two towers (75' and 100') support the VHF antennas at W3HCW, Williamsport, Pa.

Third of a Series

Getting Along with the Indians

DAVID L. HELLER, K3HNP
14 Darkleaf Lane
Levittown, Pennsylvania

The Filter And Its Installation

The high-pass filter is the solution to almost every interference problem. It acts as a direct short to ground for the undesired amateur frequencies while having little or no effect on the TV frequencies. When six meters is the undesired frequency and Channel 2 is desired, the filter design becomes critical—in fact, if we were to pass everything above 54 mc and eliminate everything below, a rather complex and expensive unit would be required. Since the upper end of six isn't of too great importance since it is not used 90% of the time, the filter cutoff can be around 53 mc.

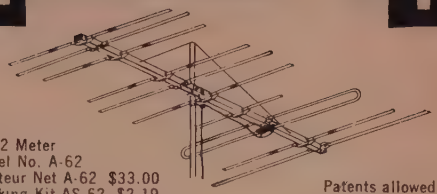
It shouldn't be too difficult to design a high-pass filter capable of separating the low end of six from the TV frequencies. Any company possessing a housebroken E.E. and some lab equipment should be able to do it. The fact is that although several filters have been distributed for TV sets to attenuate six meters, the only one I've seen that's of any value is the Drake TV-300-HP. So whenever we mention filters for TV sets we mean the Drake filter—no other. Even when interference is limited to the low bands, many TVI committees insist on installation of Drake filters, not only to allow for future problems with six meters, but also because the Drake is consistently predictable for the lower bands as for six.

Proper installation of the filter is essential. The filter should be as close as possible to the TV tuner and solidly grounded to the *tuner* chassis. Leads longer than one inch from the filter output may be excessive, and there are few installations where longer leads cannot be avoided. In some instances the ground strap on the filter is inconveniently located. The filter can then be rotated in its case 90° by unsoldering the two spots on the case and resoldering afterwards. Be careful not to touch any part of the filter while the case is open, for it can be detuned. RCA television sets use a plug-in filter as supplied by RCA directly or from Drake. The ground connection must not be omitted on these sets.

The filter is a non-symmetrical device, and in rare instances its performance can be improved by reversing it. Similarly, there are rare cases where two cascaded filters are needed. But the simple usual installation is almost always completely satisfactory. I have inspected many filter installations, and have yet to see a properly installed Drake filter fail to eliminate six meters completely from a properly-operating TV set.

Next month K3HNP presents the names and addresses of distributors who furnish free high-pass filters. ■

2 ANTENNAS IN 1



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ON 6 METERS
Full 4 Elements
1 — Folded Dipole
1 — Reflector
2 — Directors

See your FINCO Distributor
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For further information, check number 22, on page 110

Candid Camera

We have many opportunities to publish photographs of amateurs, their shacks, and antennas throughout *The VHF Amateur*. If you have any pictures suitable for publication, send them in. We pay one dollar for each printed. Drop a line for further information.

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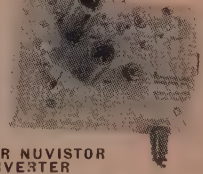


6 METER NUVISTOR CONVERTER
$28.50

AMPLIDYNE LABS
KINGS PARK LI NY
P.O. Box 673

Contest *[from page 70]*

VI. MULTIPLIERS

Three types of multipliers will be used in this contest.

A. County: Each new county worked in the contest will count one (1) point. Outside the United States equivalent political subdivisions will be accepted.

B. Hours: At least one contact during each hour in the contest period constitutes a "contest hour."

C. Power:
1. 25 watts input or under (a.m., c.w.), multiplier of 3.
2. 125 watts input or under (a.m., c.w.), multiplier of 2.
3. 1000 watts input or under (a.m., c.w.), multiplier of 1.
4. S.s.b. or d.s.b. at any power level, multiplier of 3.

VII. SCORING

Simply multiply total number of contact points × county multiplier × hours × power multiplier. Example:

200 (contact points) × 47 (county mult.) × 12 (hours) × 3 (power mult.) = 338,400 Total Score.

VIII. LOG INSTRUCTIONS

A. Logs should be as complete as possible to include your name, call, address, band operated, scoring totals, and signatures of operators. (This can go on a cover sheet).

B. Log data must include date, time, call, county, state, handle, both contact bers (his and yours), both signal (his and yours). *Time out is not re*

C. If at all possible, a letter with you ments and a photograph of you station would be greatly appreciate will speed up processing of resul save correspondence involved photos.

IX. LOGSHEETS

Specify quantity desired (each sheet ha for 116 entries). Write today to: *The VHF teur*, 300 West 43rd Street, New York 3 York.

X. LOG DEADLINE

Deadline for logs is Monday, April 15. Address all logs (be sure to include photo and a letter) to:

The VHF Amateur
300 West 43rd Street
New York 36, New York

XI. AWARDS

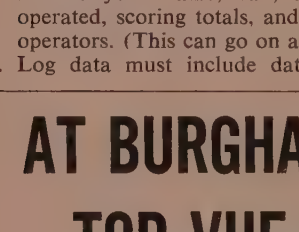
Certificates will be issued to state winn each of the categories in paragraph (III) where at least two (2) logs were receiv addition, high scoring stations overall i category will receive a high honors cert A high-scoring club aggregate certificate offered to first, second, and third high w (clubs) in that category. An engraved will be awarded the highest scoring sta the entire contest (not including club gates), donated by K2ZSQ.

AT BURGHARDT'S ITS *Clegg* FOR TOP VHF PERFORMANCE IN '63

IT'S HERE NOW!

Clegg's **BRAND NEW**

THOR 6 TRANSCEIVER FOR 6 METERS



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Talk about performance . . . listen to this . . . 60 solid watts on both AM and CW; high level modulation with full speech clipping to give you famous CLEGG "Talk Power"; true transceiver operation with tuneable oscillator in the receiver serving as the VFO in the transmitter; provision for keying the transmitter.

A low noise double conversion super-heterodyne receiver complete with BFO and ANL provides maximum selectivity and sensitivity with stability equal to the exacting requirements of SSB and CW; separate power supply/modulator for 115V AC operation. A fully transistorized power supply/modulator for 12V DC available for mobile operation. $100.

WANT HI-POWER..LOW POWER.. MOBILE..SSB..AM..CW..?

There's an incomparable CLEGG for every type of ice. And here at Burghardt we have 'em all. Fo

- The famous ZEUS, hi-power AM-CW transc 6 & 2 meters.
- The matching INTERCEPTOR RECEIVER, fond of every true VHFer.
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Stop in for a demonstration, write for literatu area code 605-TU6-5749 for a top trade at lo from one of America's most reputable ham sup

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South Dakota

For further information, check number 50, on page 110

Hams in Far East [*from page 39*]

rganization, the Malaya Amateur Radio Trans-nitting Society or "MARTS", as it is called, as about 30 members, including VS1's and M2's. They meet every few months. In the ingapore area there are about 40 licensed ams of whom approximately 25 are active. he Malaya section has about the same num-er. They can be heard on 10, 15 and 20 meters nd like Hong Kong, have no TVI because of he absence of any stations.

In arranging my itinerary I had scheduled a our-day visit to the country made famous by he play, "The King and I". Formerly known s Siam, and now Thailand, the capital city of angkok proved interesting although hot and umid. As far as I could learn, there are only few hams in the country, two of the most ctive being HS1C and HS1B, both employed y U. S. government agencies. I visited our mbassy building and could see both a ver-ical and dipole antenna on the roof, but as ar as learning anything about the operators, I ound myself up against a blank wall.

The air distance from Bangkok to New Delhi n northern India, is approximately 2,000 miles, ut it seemed ages away when I was able to ide an elephant for a short time on my way o the Taj Mahal.

Amateur radio is represented by about 200 ams, most of whom are located in Bombay, alcutta, New Delhi and Madras. The Ama-eur Radio Society of India is an active, repre-entative organization. The maximum legal in-ut power is limited to 100 watts, with the najority of rigs running 40 to 50 watts on c.w., .m. and a few s.s.b. stations. For grade 1 icenses, in addition to a test covering theory, he code requirement is 12 words per minute. or grade 2 licenses, 5 words per minute suffice. he lower grade ticket is good for only three ears, after which time the holder must qualify or the higher rating.

When the New Delhi group learned that a V2 ham was in their midst, they quickly ar-anged a supper ham party at the home of es, VU2AK. This is the same Les who headed e Andaman and Nicobar Islands Expedition, hich he described in the May 1960 issue of *ST*. At the time of my visit, his great pride nd joy was a new cubical quad which loomed arge indeed on the roof of his one-story home. had a nostalgic feeling when we were able to ontact W3CRA and I passed along my 73's. he group that I had the pleasure of meeting ncluded VU2AK and Audrey, his XYL, U2CK, VU2JG, VU2AJ and XYL, VU2KM, U2OP and XYL and VU2PO. The XYL's of OP, 2AK and 2AJ were taking their examina-ons in two months and hoped soon to be nong the very few licensed hams of their sex i India. VU2AJ is the engineer in charge of e Government of India Overseas Communi-ation Service and is also vice-president of the mateur Radio Society of India.

After a considerable amount of rag chewing and a discussion of ham problems in both our countries, we were served a delicious supper. All of the food was typically Indian and certainly seemed strange to both myself and the XYL. Since I was taking the plane the following morning for Tehran in Iran, it was with a sad feeling that I said farewell. I say sad because I felt there was little chance of my meeting with them again in their home QTH.

The India group, left to right: VU2KM, VU2PO, VU2AK, VU2CK.

VU2AK had had many contacts with Frank, W2AYN/EQ in Tehran, but since I was in that city for only one day, it was impossible for me to do anything but hurriedly see the sights and notice the elaborate decorations in honor of the birth of a male heir to the ancient throne.

My next stop after leaving Tehran was Tel Aviv, Israel. It was interesting to note that even though the flight was made in a BOAC jet at an altitude of almost 30,000 feet, the plane was not allowed to fly over Arab territory because of its landing at Tel Aviv.

I was privileged to meet and visit many hams in modern, bustling Tel Aviv. The first thing that impressed me was the fact that they were all quite young. The reason, of course, was quite obvious. Israel is a young nation and it was only natural that amateur radio should be a hobby of the youth of that country. However, with their youthfulness went a maturity, intelligence and enthusiasm that was highly contagious. Practically everyone lives in apartments and in one section of Tel Aviv I noticed that there were no less than four hams within a radius of a few blocks. In company with Hanan 4X4MB I visited Rami 4X4II. The halls of the building were dark but a time delay switch on each floor provided light for about three minutes. As a means of reducing current consumption, this arrangement was prevalent in many of the apartment houses.

The IARC which stands for the Israel Amateur Radio Club does a thorough job in representing ham radio. Their quarterly magazine is written in Hebrew, which is the official language of the country. As in all Hebrew books, you start reading at the rear and end up at what we consider the front page. The LARC official station is 4X4HQ. Other calls that have a 4X4H designation usually indicate a local club.

[*Continued on page 95*]

Contest Calendar [*from page 50*]

2. Each completed contact counts three points.

3. Each French province or DUF country worked on each band counts one in your multiplier. (excluding F & FC)

4. Final score: Total QSO points multiplied by the total multiplier on all bands.

Both your contest logs and awards applications go to: The REF BP 42 01, Paris R P, France.

Helvetia 22

Starts: 1500 GMT Saturday, April 6th
Ends: 1700 GMT Sunday, April 7th

The popular H 22 Contest will probably run into some difficulty this year because of a conflict with the PZK C.W. on the same date. Rules:

1. Use all bands, 1.8 thru 29.7 mc, c.w./c.w. or phone/phone.

2. Serial numbers will be the usual five or six digits, signal report plus a progressive 3 figure contact number.

3. Each contact counts 3 points and the same station can be worked twice, once on c.w. and again on phone.

4. The multiplier is the sum of Swiss Cantons worked on each band, c.w. or phone, making a possible multiplier of 22 on each band.

5. Your final score therefore will be the sum of QSO points on all bands, multiplied by the number of cantons worked on each band.

6. Use a separate log sheet for each band and only one side of the paper.

7. Certificates will be given to the highest scorer in each country. Each district in the United States and Canada will be considered as a separate country for award purposes.

8. Your logs must be postmarked no later than April 31st and go to: HB9ZY, Traffic Manager USKA, Meggen, LU/Switzerland.

Names and Abbreviations of Cantons

Zurich	ZH	Sclaffhouse	SH
Berne	BE	Appencell	AR
Lucerne	LU	St. Gall	SG
Uri	UR	Argovie	AG
Schwyz	SZ	Thurgovie	TG
Unterwald	NW	Tessin	TI
Glaris	GL	Vaud	VD
Zoug	ZG	Valais	VS
Fribourg	FR	Neuchatel	NE
Soleure	SO	Geneva	GE
Basle	BS	Girsson	GR

P. Z. K. C.W.

Starts: 2000 GMT Saturday, April 6th
Ends: 2000 GMT Sunday, April 7th

Phone

Starts: 2000 GMT Saturday, April 20th
Ends: 2000 GMT Sunday, April 21st

This is the second year for this contest but this year appears that the operation will be made difficult because of date duplication on both weekends. Only contacts between Polish and foreign stations will count.

1. Use all bands, 3.5 thru 28 mc.

2. The usual five and six digit serial number RS/RST report plus a progressive QSO number starting with 001.

3. Each completed QSO counts 1 point. The same station can be worked once on each band.

4. Your multiplier is determined by the number of SP call areas worked per band.

5. The final score is the sum of QSO points multiplied by the sum of the multiplier from all bands.

6. There are two classifications, single operator and multi-operator stations. However multi-transmitter operation is not allowed.

7. Awards will be made to the highest scoring station in each classification in each country. (I would strongly recommend that the committee consider awards for each call area in the USA and Canada and other countries covering large areas.)

There is also an s.w.l. division and scoring the same as for transmitter entries. However s.w.l.'s are obligated to note the call signs of both stations and at least one serial number.

Your logs go to: The P.Z.K. Contest Committee, P.O. Box 320, Warsaw 1, Poland.

North Dakota Party

Starts: 9:00 A.M. CST Saturday, March 9th
Ends: 9:00 P.M. CST Sunday, March 10th

The prime purpose of this QSO Party is to assist stations in making contacts for their NDSP CA and USA-CA. This is right up Clif Evans

[*Continued on page 88*]

Claimed Scores
CQ WW C.W. DX Contest

Single Operator

All Band

HC1DC	759,000
W3GRF	445,884
PY1ADA	296,815
K6CTV	282,529
W8JIN	267,090
W9EWC	220,038
KR6ML	200,734
ZP9AY	160,038
VE2NV	157,896
WA2OJD	145,550
W6GRX	129,240
W7PQE	123,255

28Mc

HK7ZT	3,276

21Mc

W3LSG	39,900
W1WY	36,708
WA6SBO	27,200
W6BSY	19,824
W8RQ	18,492
K3AIG	16,298
K9LIO	12,960
K5UYF	12,432
JA8ADQ	11,430
HB9DX	10,434
ZP5JP	6,816

14Mc

W4KFC	189,912
UC2AA	183,580
ST2AR	166,635
W4WDI	129,220
W3JTC	106,848
W6EPZ	91,214
W2BOK	89,505
JA8BI/1	83,898
G3HDA	69,468
W3AFM	58,208
CN8FE	53,735
W1GYE	48,616

7Mc

K2GL	43,670
W6JZH/6	43,068
YV5ANT	34,476
W6PQW	33,051
W4CKD	29,465
OH2EW	18,356
G3EYN	16,701
W9ERU	10,726
DJ1ZN	10,388
K1SDX	9,550

3.5Mc

W1BU	12,349
OE1WO	6,[illegible]
W7JLU	3,[illegible]
W8AJW	2,[illegible]
OH6TM/2	1,[illegible]
KL7JDO	1,[illegible]

1.8Mc

UB5WF	1,[illegible]
G3IGW	1,[illegible]
W2FYT	[illegible]
WØCDP	[illegible]
W2EQS	[illegible]

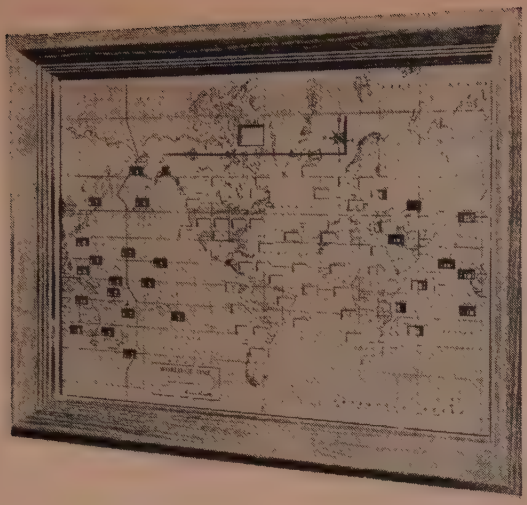
Multi-Operat

Single Xmtr

HKØZU	791,[illegible]
W1BIH	427,[illegible]
K1RTB	250,[illegible]
KØUTX	206,[illegible]
KX6AJ	205,[illegible]
W7UXP/KH6	147,[illegible]

Multi-Xmtr

W3MSK	1,043,[illegible]
DJ3JZ	816,[illegible]
K6EVR	763,[illegible]
W4KXV	517,[illegible]
W6IBD	293,[illegible]



If it's 10 O'Clock in your shack

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With a World of Time electric wall clock, you'll know the answer is 6:00 O'Clock — same as for Moscow. Set the World of Time clock for the correct hour in your zone (with daylight saving time adjustment) and you know the correct Standard Time in 70 different cities and in every time zone. See at a glance the location of your contact, his time zone, and the present hour there . . . whether he is on the hourly, half-hourly, or even the 20-minute system, as in Monrovia!

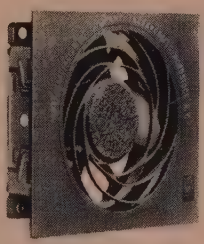
Amateur Net $49.95

OTHER HARVEY VALUES OF THE MONTH

Imported

Monarch Model MT-220 Volt Ohm Meter—
Ranges — DC Voltages: 0-2.5 - 10 - 50 - 250 - 500 - 5000 Volts (20,000 ohms per volt) . . . AC Voltages: 0 - 10 - 50 - 250 - 500 - 1000 Volts (10,000 ohms per volt) . . . DC Current: 0-0.05 - 5 - 50 - 500 mA . . . Resistance: 0 - 12K - 120K - 1.2M - 12M ohms (60 - 600 - 6K - 60K mid-scale) . . . Decibels: –20 to +62 db. Amateur Net $14.95

Uni-card **Use your UNI-CARD at Harvey**



Rotron Whisper Fan—
The fan that moves 60 cu. ft. of air per minute . . . while running so silently you have to look to see if it's running! Removes heat to save your rig, yet uses only 7 watts. Measures 4½" square by 1½" deep. Has run for years in computers and other commercial equipment without attention—lifetime lubricated. Amateur Net $14.85

Extra-Sensitive Head Phones by Superex—
600-ohm impedance; extra-high sensitivity for weak signals and hard-to-read stations . . . reproduction is crisp, free of distortion . . . unequalled wearing comfort over long use. Amateur Headphone Model AP-S. Amateur Net $24.95

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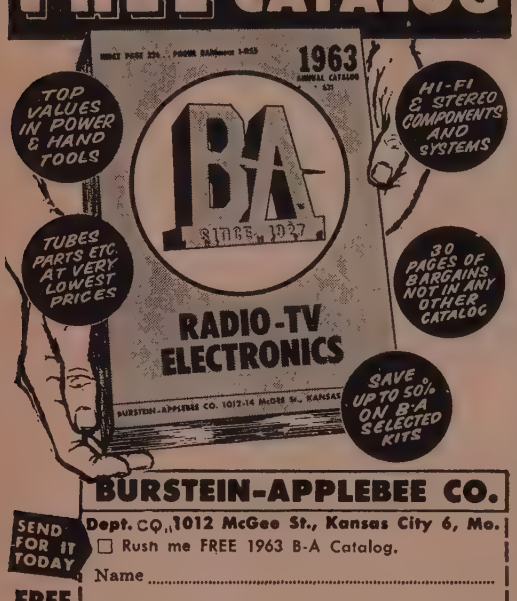

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Originally $149.50

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MM2 ADAPTERS
RM 50
for 50 kc... $12.50
RM 80
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RM 455 for 455—500 kc IF.... 12.50

We bought the entire factory stock and Terry says, "Clear 'em out at $99.50!" Analyzes every transmitter RF and AF function . . . also analyzes IF patterns of incoming signals. No tuning. Just plug it in and it's ready to use. Complete with tubes, scope and instruction book. No more at this price. Only $5 down!

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Enclosed $..... Ship me.....
I will pay balance in ☐ 1 year ☐ 2 years

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Address.....
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☐ Send latest Reconditioned Equipment Bulletin

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Amplidyne C-61 [*from page 42*]

is conducted at the lower end of the band. sides this, sufficient gain was still availabl the upper end to maintain a good s./n. ratio

Good freedom from overload and cross m lation was experienced, and unwanted i.f. si rejection was excellent.

Since the converter is crystal controlled, quency stability was no problem. This respo bility lies with the 14-18 mc receiver used the unit.

Two points should be noted when the M C-61 is set up with the receiver. With the i terminals of the converter shorted, the i.f. control on the *converter* should be adjusted point where the noise level from the conv slightly overrides the noise level of the rece (by 3 to 5 db). This will provide an adeq signal-to-noise ratio and at the same time re the chances of front-end overloading and c modulation effects' occurring in the receive self. It should also be noted that in many all-b receivers the bands are split in the 16- to 18 region, so not only will the 50 mc band be l wise divided, but the overall gain may vary, pending on the receiver's sensitivity over the range.

Its nice performance and low cost ($28 including matching power plug), make Model C-61 a good buy. A companion solid-s power supply is also available at $9.75.—*W2A*

VHF Contest Rules [*from page 32*]

VIII. SCORING

Scores will be computed by multiplying the contact points × *total* county multiplier × *total* multiplier × 1.25 (power multiplier, if applicab

EXAMPLE:
100 Contacts
× 10 Counties
1000
× 10 Hours
10,000
× 1.25 Power Mult *(If applicabl*
12,125 Final Score

Multi-band stations will compute their score *adding* contacts, counties, hours on all bands; t proceeding as below.

EXAMPLE:
200 Contacts (100 on 50 Mc 100 on 144 Mc)
× 20 Counties (10 on 50 Mc— 10 on 144 Mc)
4000
× 20 Hours (10 on 50 Mc— 10 on 144 Mc)
80,000
× 1.25 Power (Use only *once* if applicable)
100,000 Final Score

IX. AWARDS

A) Certificates will be awarded to the high scoring station in each state or country on e band or bands. Additional awards will be made this category at the discretion of the Contest C mittee.

B) A certificate will be awarded to the high scoring entry in the club aggregate competition

TEST EQUIP. • XMITTERS • RECEIVERS

(IN GOOD WORKING CONDITION)

FREQ. METER, Navy type LM, with orig. cal. book	$ 49.00
FREQ. METER, TS-173, 90-450mc, orig. cal. book	95.00
FREQ. METER, TS-175, 85-1000mc	95.00
SIG. GEN., Triplett #3433, AM/FM, 100kc-120mc	65.00
SIG. GEN., URM-25, 10kc-50mc	175.00
SIG. GEN., URM-25A, 10kc-50mc	195.00
SIG. GEN., URM-25-D, 10kc-50mc	250.00
SIG. GEN., URM-26-A, 3-405mc, LN	295.00
SIG. GEN., URM-26-B, 4-405mc	275.00
HICKOK-188X, AM/FM, 100kc-110mc	59.00
SIG. GEN., General Radio 700-A, 50cy.-5mc	125.00
SIG. GEN., General Radio P-522A, 50-1000mc	125.00
SIG. GEN., Measurements Corp. #75, 50-400 mc	95.00
ELECTRONIC COUNTER, Potter-850	350.00
AUDIO OSC. Hewlett-Packard-200-C	$ 65.00
POWER SUPPLY, Lambda-28, new	45.00
VHF BRIDGE, Hewlett-Packard 803-A, new	595.00
AUDIO FREQ. METER, Hewlett-Packard 500	99.50
SCOPE, Browning Labs., ON-5 oscillosynchroscope	95.00
SCOPE, Tektronex model 512	195.00
SCOPE, Western Electric 80 or TS-34A	49.00
SCOPE, Dumont-208—$49.00, 224—$49.00, 241	65.00
RECORDERS, Esterline-Angus & Bristol, from	50.00
V.T.V.M., Ballantine 300	50.00
TUBE TESTER, Precise—#111 & #116	59.00
IMPEDANCE BRIDGE, GR-650A	125.00
GR-759-B, Sound level meter	125.00

TRANSMITTERS & RECEIVERS •

ELMAC, AF-67	$ 95.00
Hallicrafters HT-40	79.00
LW-51, 2 and 6 mtr.	65.00
Johnson Viking II	145.00
Heath DX-100	135.00
Eico 720	65.00
Globe Chief 90	49.00
Globe Chief Deluxe	59.00
Heath DX-40	55.00
Heath DX-20	28.00
Eldico SSB-500 linear	195.00
Sonar SRT-120 & VFO	75.00
RME-4350	$165.00
Hallicrafters SX-140	89.00
Hammarlund H.Q. 140	165.00
National NC-300	225.00
Hallicrafters S-85	79.00
National NC-125	95.00
Hallicrafters S-95	45.00
National NC-93	79.00
Hallicrafters S-108	95.00
Hammarlund H.Q.-129	125.00
HRO and 4 coils	75.00
APR-1 and 3 coils	95.00

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ELMAC AF-67, PMR-8 and M-1070 Supply	$225.00
HARVEY WELLS, Bandmaster Delux, less 2 mtr.	45.00
TCS Xmitter, receiver and 12v. supply	75.00
SUPER-PRO, B.C. 779 with 110v. supply	95.00
NAVY RBS, receiver, 2-20mc with 110v. supply	49.00
450mc FM receiver, RCA-CRUI-A, new	45.00

MISC.

TBS Xmitter, 100 watt, 60-80mc, FB 6 mtr.	$ 40.00
Code Keyer TG-34A, learn the code	24.00
Dynamotor, PE-103, 6 and 12v.	15.00
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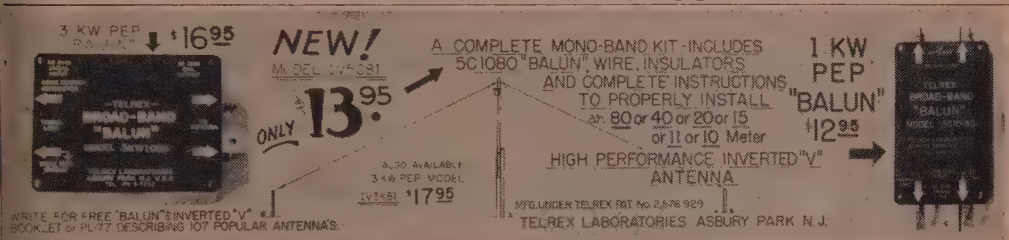
For further information, check number 45, on page 110



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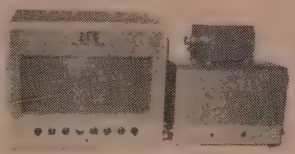

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IA Standards of 525 lines, 60 Fields, 30 Frames and 2:1 interlace—Aspect Ratio 7:3—Capable of 700 li. Horizontal resolution and 350 li. Vertical

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Write for quantity discounts or phone Victor 2-5574

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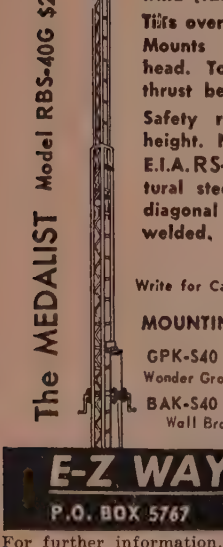

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Safety rest locks tower at desired height. No weight on cables.

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The MEDALIST Model RBS-40G $209.50

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Wonder Ground Post

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Wall Bracket

$169.50
MODEL RBS-40P.
Dip painted

E-Z WAY TOWERS, Inc.
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For further information, check number 34, on page 110

addition, an engraved trophy will be awarded by on a rotating basis to the overall high scoring in the club aggregate category.

X. DISQUALIFICATION

Violation of the amateur rules, the rules of contest, unsportsmanlike conduct, or insufficient data will be deemed adequate cause for disqualification. Amateurs entering this contest agree to abide by the decision made by the Contest Committee.

XI. DEADLINE

All logs must be postmarked NO LATER than June 1, 1963. Logs received after this date will be used for checking purposes only! Results of the contest will be published in *CQ* for August. Send logs directly to:

CQ V.H.F. CONTEST COMMITTEE
300 West 43rd Street
New York 36, New York

Ham's Lament [*from page 44*]

And some lid decided to use your call,
And he worked four countries on the band list;
And you just ran a phone patch for a DX ham
And you didn't know his country didn't allow third person traffic with us,
And our state department is up to it's neck in hot water,
And they want to deport you;
Is that why you're banging your head against the wall? Well—LIFT UP YOUR HEAD, FACE THE WORLD, NEVER GIVE UP! NO! NEVER . . . NEVER, NEVER, NEVER . . . never, never, never, never, nev . . . .

Contest Calendar [*from page 84*]

alley and he tells you all about it, page 63 his column in this issue.

Your logs must be postmarked no later than April 6th and go to: North Dakota QSO Party, NDSU ARS, E.E. Dept., Fargo, No. Dakota.

West Virginia Party

Starts: 6:00 P.M. EST Saturday, March 30th
Ends: 12:00 M. EST Sunday, March 31st

In celebration of West Virginia's 100th Year, The State Radio Council is sponsoring a QSO Party. Here again is another opportunity for CHCers to make hay. Clif, K6BX covers this one too.

Mailing deadline is May 1st and your logs to: Ross Kirk, K8YBU Contest Chairman, 96 6th Avenue, St. Albans, West Virginia.

Ed. Note

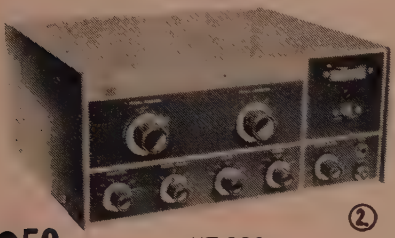
With all our space taken up by an unusual load of events, there is little space left for any remarks this month.

A suggestion to you fellows that have missed the fun on the Top Band this season. It's not too late to give 160 a whirl on a week-end during the month of March. There have been some fine DX openings.

We have just been informed that the U.B.A. contest (Belgium) is being held on the same

New!

HE-80WX **149.50** NO MONEY DOWN ①



79.50 NO MONEY DOWN KT-390 Made in U.S.A. ②

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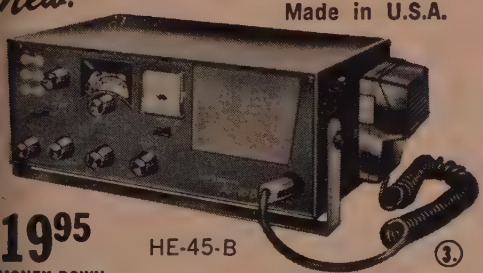

19.95 MONEY DOWN HE-45-B ③

99.95 MONEY DOWN HE-30 ④

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Similar to above except for 10-meter operation ... **119.95**

4. THE LAFAYETTE HE-30 Professional Quality Communications Receiver

● Tunes 550 KCS to 30 MCS in Four Bands ● Built-in Q-Multiplier for Crowded Phone Operation ● Calibrated Electrical Bandspread on Amateur Bands 80 Thru 10 Meters ● Stable Oscillator and BFO for Clear CW and SSB Reception ● Built-in Edgewise S-Meter

Sensitivity is 1.0 microvolt for 10 db. Signal to Noise ratio. Selectivity is ± 0.8 KCS at —6db with Q-MULTIPLIER.

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For further information, check number 24, on page 110

Terry Sterman
W9DIA

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NAME .....

ADDRESS .....

CITY..... ZONE..... STATE .....

☐ Check here for Latest Reconditioned Equip. Bulletin

For further information, check number 40, on page 110

date and time as the REF. We have no oth information except that ON stations will use t usual serial numbers and also give their provin for the WABP award.

The list of claimed c.w. scores were taken fr some of the early received logs. Don't get d turbed if yours is not listed. I have a feeling th some of the bigger scores are yet to be receive

73 for now, Frank, W1W

Knight-Kit SWR Meter [*from page 31*]

pick-up unit between the transmitter and a lo pass TVI filter, it will be found that more a curate indications of the s.w.r. and power w be obtained with the unit connected betwe the filter and the transmission line due to t resulting attenuation of harmonics from th transmitter.

In connection with the first step und "measuring s.w.r." on page 14, the transmitte or input-end of the pick-up unit is the one wi J_1 which is located next to the meter-cord bus ing. J_2, the transmission line- or output-conne tor, is at the opposite end of the box.

Also on page 14, the SWR/Reflected-Usefu Power chart contains several errors. The co rections are as follows (these have been include in later production models):

SWR	% Reflected Power	% Useful Pow
5	44.4	55.6
6	51.0	49.0
8	60.5	39.5
1.5 (*add*)	4.0	96.0

A feature of the meter scale, not mentione in the Manual, is that by adding a "zero" to th figures on the relative-power scale, the perce tage of reflected power for the indicated s.w. may be read directly.

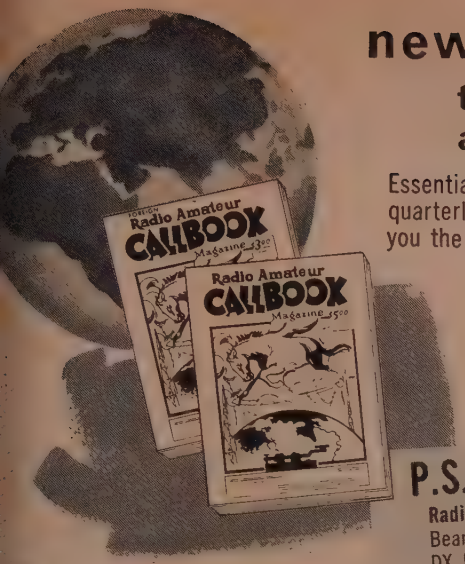
Another point to note is that an s.w.r. met of this type will not indicate the true s.w.r. du to load mismatch unless the transmission-lin is a multiple of an electrical half wave[1]. An e ample of this was clearly demonstrated b readings made with a 2:1 mismatched loa With the load connected directly at the instr ment, or by a half-wave line, the s.w.r. rea correctly at 2:1, but at intermediate line length it read different values, even as low as 1:1.1.

The instrument also may be used for mod lation monitoring. With a constant-carrier 100% amplitude modulated transmitter, the meter wi rise about 5% with full voice modulation. Du ing controlled-carrier a.m. or s.s.b. transmission the meter should kick up ¼ to ½ the amou indicated during tune-up at maximum outpu Also for s.s.b., the meter may be used as a nu indicator when the carrier is balanced out.

Once the Model P-2 has been used, it will b found hard to get along without it, making it worthwhile low-cost investment.

[1]Length in feet $= \frac{492 \times V}{freq.\ uc}$

Where: V = velocity constant of coax line (0.65 for most coax).



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Novice [*from page 57*]

We Get Letters

Quoting, in part, from a long letter from my old friend F. Allan Herridge, G3IDG, 96 George Street, Basingstoke, Hampshire, England:

"Dear Walt: Hello again. If you have a copy of *CQ* for February 1956 handy you'll find a letter from me to you therein. Welcome back to the fold OC. Letters from the DX stations are obviously more plentiful now than in '56 but you may find the following of interest.

"My first Novice was worked on October 13, 1956 (KN2QQZ) and since then I've logged QSO's with 89 different Novices all on 21 mc. The first 76 were worked while I was in London and they gave me 16 states. The remaining 13 have been QSO'd from the present QTH since August '61 and they represent 10 states.

"But, what impresses me is the percentage of QSL returns from these Novices. All 89 stations have been QSL'd direct if the QTH was known, otherwise, through the bureaus. Of these, 68 have replied. My overall QSL percentage from September 1951 is 65 percent, yet the Novices have come through with a 78 percent return, this is quite a difference. Well done Novices! A breakdown of the Novices per call area shows, 1-22, 2-26, 3-9, 4-21, 5-1, 6-nil, 7-nil, 8-5, 9-4, Ø-1.

"Walt, I get the impression that the average Novice knows little of the QSL Bureaux. I have 86 percent return from the QSLs sent direct, but only 45 percent of those sent via the bureaux have brought replies.

"An outstanding QSO of late was with KN1-VUP of Wiscasset, Maine. This station is run by the Rev. J. Reginald Butt, a 41 year old Episcopal (Angelican) priest. His sole policy is what he calls "Operation International Friendship"—No hullo-Goodbye QSO's from him, just real friendly rag-chewing.

"73, Walt. Keep at that NOVICE Column, and my best wishes for 1963. Sincerely, Allan."

Keep up your good work and I nominate you for a membership in the Good Rev. Butt's Friendship Club, no dissenting vote.

Only one fellow needs help to get his ticket this month and he is: Robert Van Winkle, General Delivery, Olivehurst, California. He said it too took a long time to get up the nerve to ask for help. Let's show him it was worth the trouble.

The letters section this month shows that many of you fellows are not tuning your receivers carefully and are therefore missing a lot of DX that is calling, trying to work you, give you a new country and make your operation more enjoyable. Tune your receiver slowly and take time to copy some of the signals from foreign hams even if they are not calling you. Don't forget, the foreign ham is looking for W's and K's to help win that beautiful USA-CA Award

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HQ-105TRC	Receiver/Transmitter, in cabinet, with clock (24 hr.)	229.45	20.57	11.22	8.10
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HQ-180C	Receiver only, in cabinet, with clock	439.00	39.78	21.70	15.67
HQ-180XE	Receiver with 11 crystal control fixed freq. plus VFO — less crystals	499.50	45.32	24.72	17.85
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HX-500	Transmitter in cabinet	695.00	63.25	34.50	24.91
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that Clif sends to hams that contact 500 or more counties in the USA. You might be the one that puts some DX ham over the line. Award hunting is one of the most interesting facets of ham radio, but don't let it rule all of your operations. Make friends, improve your operating skills, put out the best signal that your rig can and try to be the best operator that some one has contacted.

I will shortly be contacting some of you on the lower bands and I'm sure we can have some nice ragchews and then next summer we can talk it over in person at the local ham fest. Until then, 73, Walt, W8ZCV

DSB-100 Modified [*from page 34*]

rather high impedance load. Impedance transformation always means losses that increase as the impedance stepdown ratio increases. The network used in the DSB-100 is a pi-L network for matching low impedances on 80 meters. Inductor L_8 is switched in or out by a slide switch on the rear lip of the chassis.

Efficiency of the matching circuit can be increased 15% to 20% by shorting out L_8 (or removing it) and replacing its action by having the switch parallel a transmitting mica capacitor across the coax output. The switch (S_5) should be removed, turned upside down, and reinstalled so that the indicated function will be the same.

As everyone's antenna impedance differs, it is difficult to specify a single most desirable value of capacitance to use in this shunting position. Perhaps as good a starting value as any is 300 mmf, increasing it as necessary. Perhaps the easiest way to tell is to parallel an ordinary broadcast tuning capacitor *outside* of the transmitter to find what capacitance is necessary. Then obtain a transmitting mica of that value for inside installation. The old and revised circuit is shown in fig. 5.

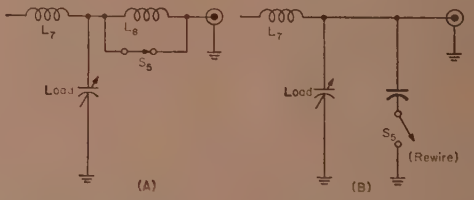

Fig. 5—The original (A) and modified circuit (B) to match low impedance loads more efficiently on 80 meters. Inductor L_8 is removed and S_5 rewired to switch in a capacitor. The value of the added capacitor is discussed in the text.

Conclusion

It is a tribute to the designers of the DSB-100 that there is nothing that *must* be done to the transmitter (except the routine antenna filter). Each of the changes listed here are considered desirable, but may not be at your station. These modifications do not change the operation of any circuits or controls in the DSB-100. Adjustment and alignment instructions in the manual are unchanged. All in all, the only change was in the convenience and effectiveness of the author's station. ■

Hams in Far East [*from page 83*]

Class A licensees are allowed an input of 250 watts and must copy code at 16 words per minute. Class B is limited to 25 watts and the code requirement is 12 w.p.m. As in our own country, there is a novice class license which limits the operator to 10 watts crystal controlled on 40 meters c.w. only.

The examinations for A and B licenses are quite difficult. Questions and answers are oral except for schematic diagrams. The examiner also has a great discretion in the type of questions he may ask. As far as I could see, most antennas were verticals, dipoles and a few long wires. As in a number of the other countries, there are no TV stations as yet. Although sideband stations were comparatively few, stateside single sidebanders might keep a lookout for the following in the Tel Aviv area—4X4JT, 4X4IX, 4X4CW and 4X4JM.

Tel Aviv is noted for its hundreds of sidewalk cafes and it was at one of these on Dizengoff Street that I was invited to meet the following group—Tuvia 4X4GT, Ilan 4X4JT, Abe 4X4IX, Rami 4X4II, Haiim 4X4CK, Ozzi 4X4CW, Uri 4X4JN, Evi 4X4JM, Hanan 4X4MB, Mike 4X4JQ and Bob 4X4CJ. The only other U.S. ham present besides myself was Rick K7ADD, who had just arrived from Las Vegas to take up permanent residence in one of the many "kibbutzim" or community farm projects.

From Israel I headed for Rome and then across the Atlantic to New York, thus completing an around-the-world circuit. I suppose it is almost inevitable that after a trip such as this, certain conclusions should be drawn and opinions crystallized. The first thing that remains indelibly impressed on my mind is that amateurs the world over, irrespective of their color, their religions, or their language, are as friendly, intelligent and enthusiastic a group as could be found anywhere. It somehow seems that amateur radio has the peculiar faculty of attracting a certain type of individual who possesses to a rare degree all of those wonderful qualities.

Secondly, it appears that we in the United States do not begin to realize how fortunate we are that the means to procure equipment of a high caliber is so readily available. In country after country, because of currency restrictions and high import duties, it is virtually impossible to purchase any ham equipment from the few places where it is manufactured. And yet because of this, I have seen displayed some of the finest examples of ingenuity and craftsmanship in modernizing old transmitters and receivers or building new gear.

And lastly, I came away with the wishful thought that if it were only possible for people all over the world to have something in common, such as our wonderful hobby, how quickly friendship and peace would spread to the four corners of the earth.

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80 & 40 M. Converter [*from page 30*]

copper at the center slightly right of the board and each end leg on the ground strip on the edge of the board.

The converter is then ready to align. For those who might want to build this unit without using the printed circuit, the parts layout is not at all critical except that the antenna coil must be shielded from the other two coils. The prototype was built here in three sections, the r.f., mixer and oscillator. Each section was built on a 2 ground 5 lug terminal strip. These sections were then interconnected.

Alignment

The antenna and mixer coils are first set to the approximate center of the band (either 80 or 40 meters depending on which is built) using a grid dip meter. The oscillator coil is then set to approximately 3000 kc for 80 meters or 6000 kc for 40 meters. The output of the oscillator is then monitored on a calibrated receiver and the oscillator frequency is adjusted to exactly 3000 or 6000 kc. Placing the oscillator on these frequencies will allow the broadcast receiver to give a more or less accurate indication of the frequency being listened to by adding either 3000 or 6000 kc to the receiver calibration for example 800 kc on the receiver will indicate 3800 kc for the 80 meter model while 1200 kc on the receiver will indicate 7200 kc on the 40 meters model. The antenna and mixer coils may then be peaked for maximum sensitivity while listening to actual signals on the band. It should be noted that if the unit is mounted in a metal box, the oscillator frequency will have to be readjusted when the installation is finished since the metal case will introduce more stray capacity in the oscillator circuit and will therefore lower the frequency.

Notes on Performance

Although this unit was designed for 12 volts operation, it will work satisfactorily with 6 volts. The unit was tried here with four 1.5 volt flashlight batteries but had slightly less gain. The stability is quite good since there is no heat produced to affect the oscillator and, with printed circuit construction, mechanical vibration is just about eliminated. The only problem that might be run into is voltage variations if the voltage regulator is not quite up to par. This can be remedied by using a zener diode voltage regulator in a circuit as shown in fig. 5.

Fig. 5—Zener diode voltage regulator will provide a constant 10 volt output. The diode is a Transitron 1N1770 or equivalent

The sensitivity of the converter when tested using the doublet antenna and my 8 transistor car receiver compared quite favorably with that of my fixed station receiver (a Heathkit Mohawk) and it proved more than expected when used in the car with the whip. The best point in favor of this converter is its price; it cost me less than $6.00 of depreciated Canadian currency. ■

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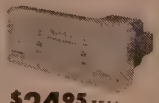

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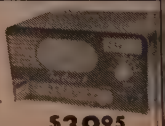

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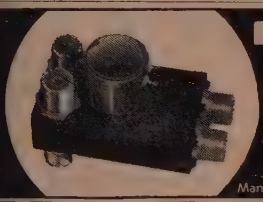

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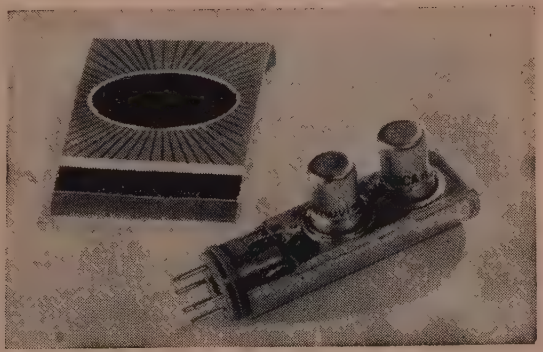

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See page 26 Sept. CQ for a review of the NUVISTAPLUG.

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For further information, check number 31, on page 110

Sideband [*from page 54*]

With their usual generosity, The Hallicraf Company will play host at a special noon-t DX Luncheon for all foreign sidebanders join in the festivities on March 26. The Lunch will also be open to W/K DXers and an nouncement will be made just prior to luncheon as to where tickets may be purcha

Advance tickets to the Sideband Dinner-H fest at $12.50 each are available from Bu Robins, W2JKN, 4665 Iselin Avenue, New Y 71, New York. Purchased at the door, t tickets will be $13.50 so get your reservation now. Hamfest tickets only will be available $1 each at the opening at 10 AM. Don't another minute—write today to W2JKN!

From Our Mailbag

"I was most interested and pleased to r your comments in December *CQ* about sig reports. I fully agree that a two-way contact m be Q-5 S-O. Latest experience showed me truth of this. Furthermore, we, in aviation, h already several years ago dropped complet the strength report on signal reports for vo communication; now there is only a readabi scale used and reports given range from 5 do to 1, no matter what the actual signal streng

"Recent operation on 20 meters showed again that quite a lot of Ws lack operating pr tice, and, if they'd listen more and talk less, t could easily work that 'rare one,' 9Q5RK! (proof of this, one can ask K1FNL, WØBM W3NTL, W2VCZ, W1LTY, W3FUN, W2C K5EYT, W7EQB, WA6EYP, K1QAJ/6, AIM, and WA2BLH, *etc.* how they did it!"

73, Roby, ex-LX1

"Regarding the comment in your column December, 1962, on signal reports for s.s.b. tions. During the week or so that VR3L/1 operational on twenty sideband, I gave ma many reports to East Coast and European tions of R5 an SØ. These signals did not e begin to indicate on the S meter. The recei was a very quiet 75A-4. It has a measured s sitivity of 0.1 microvolts for a 10db signal n/n. There also was virtually no external n present. During most of the East Coast European contacts, a headset was crammed h way thru my head in order to hear some of th stations. Some of the stations gave me R5 S6 and then proceeded to have me repeat th reports as many as five times before they copi

"I hope you will either prove or disprove ridiculous idea of a three by three report be necessary for DXCC. My QSL manager plagued by numerous requests to change reports. She was instructed not to do this, a as far as I know, made no changes.

"Reports handed out were in direct proport to the signal strength as received on Canton some instances, stations receiving R5 rep should have had R3. You can't hear it if it i there." Bob, KB6CL/W6QMN, ex-VR3

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For further information, check number 53, on page 110

P.S. Your definition of an SØ signal (faint, barely perceptible) sounds like some of the *stronger* SØ signals.

Dayton Hamvention 1963

Hardly seems that we just returned home from a real great time at the 1962 Dayton Hamvention and here it is time to begin making plans to make the return trip. One of the more active groups, the Dayton Amateur Radio Association is making plans for their 12th Annual Hamvention to be held April 26th and 27th at the Dayton Biltmore in Dayton, Ohio.

The thousands of local hams and the hundreds who come from all over the country and the sprinkling of DX visitors who pop up for this internationally renowned convention will be on the receiving end of a most enjoyable program including sideband, DX, c.w., RTTY, a.m., *etc.*

Following more than 24 hours of fun and meetings, the Hamvention is topped off with the greatest of all banquets — and the prizes! ! ! Fabulous is the only word we can think of!

Put a large circle on your calendar around the 26th and 27th of April and join everybody going to the Dayton Hamvention.

RSGB Golden Jubilee Celebration

Thanks to Frank, G2FUX, we are pleased to bring you news of the Golden Jubilee Celebration of the Radio Society of Great Britain to be held during the first week of July, 1963. Included in the program will be visits to the BBC and other places of technical interest; luncheons; sightseeing tours; and the Golden Jubilee Dinner, which will take place on July 5. The organizers of the program are looking forward to welcoming hams from all over the world and it is hoped that many Americans will plan to visit London in July. Further information may be obtained from the RSGB, New Ruskin House, Little Russell Street, London, W.C. 1, England.

73, Irv and Dorothy

Space [*from page 58*]

which operates on 136.980 mc. This 50 milliwatt transmitter radiates an unmodulated, continuous signal which provides tracking information to NASA's Minitrack network. The beacon transmitter uses a ¼ wave whip antenna mounted on the top of the satellite.

A receiver, geared to the sweep-frequency transmitter is used aboard ALOUETTE for measuring the time it takes for the transmitted pulse to strike the topside of the ionosphere and be reflected back to the satellite. This receiver is also used for measuring cosmic noise levels in space. The level of cosmic noise at frequencies within the swept range is sent back to earth via the satellite's telemetry channel. In addition, ALOUETTE carries a Very Low Frequency receiver to listen to "whistlers" in the 1-to-10 kilocycle range. Whistlers are audiofrequency electrical impulses, triggered by lightning discharges, which travel halfway around the world along lines of magnetic force. Study of whistlers can provide important information about th ionosphere. Detectors aboard the satellite a also measuring cosmic rays in an effort to fir out what happens to the ionosphere during radio storm or auroral display.

Stations for commanding the ALOUETT satellite and for receiving and recording tel metry data are located in Canada, Alaska, Equ dor, Chile, England, Singapore, South Atlant and Australia. During its first three months operation, ALOUETTE sent back an average 5000 ionograms per week showing importa characteristics of the ionosphere's topside. addition, ionospheric measuring stations at va ious ground locations are pulsing the ionospher from below for comparison with the satellite topside measurements. NASA plans to launc another satellite in its Topside Program durin early 1963. This satellite, called S-48 wil lmak fixed-frequency measurements of the ionospher

The NASA Topside Program, and satellite like ALOUETTE and S-48, may make possibl more efficient high frequency communications i the years ahead. The results of this progra could have important significance for amateu radio. 73, George, W3AS

YL [*from page 66*]

osity as to what her parents were saying on c.w Judy is now married, has one jr. op, and whe her parents are at their hunting and fishing cam 100 miles from Marquette, they have frequen skeds on 75. George travels during the week an Zelma keeps in touch with him via mobile. Bot families work all bands.

Here and There

YL CHC Chap. 4 has started a new net: Tues at 1800 GMT on 14.240 mc. NCS W6YZV an K1OYM. OMs are welcome to make contact for HYLH and HTH.

P.S. to the write-up on the Rydens in Nov *CQ*: Sally, W8ONW, has her DXCC, making all four in the family. . . . To her WPX on eac phone and c.w., Mary, K8ONV, has added mixe WPX.

New officers for the Georgia Peaches: Pres K4LIU; V.P., K4IFF; treas., K4HSC, secy K4RHU, NCS, K4ZNK. The Peaches hav changed their net freq. (Thurs. 1400 GMT) fro 7.260 to 3.860.

Re the WRONE certificate: work 6 member after May 1, '59, with 3 N.E. states represente For the sticker work a member in each of th other 3 N.E. states. Send QSLs or copy of lo (certified by officer of club or 2 amateurs tha the cards are in order) and 20¢ to cover cos to custodian, K1IZT, Blanche Randles.

BAYLARC officers for '63: Pres., WA6LI V.P., WA6PKP, secy, K6SZT; treas., WA6JG board members: W6BDE, WA6LYA, K6CU *Splatter* editor, K6USC.

From S.A.W.R.C. *YL Beam*: "The 'upp crust' is a bunch of crumbs held together by the own dough." 33, Louisa, W5RZ

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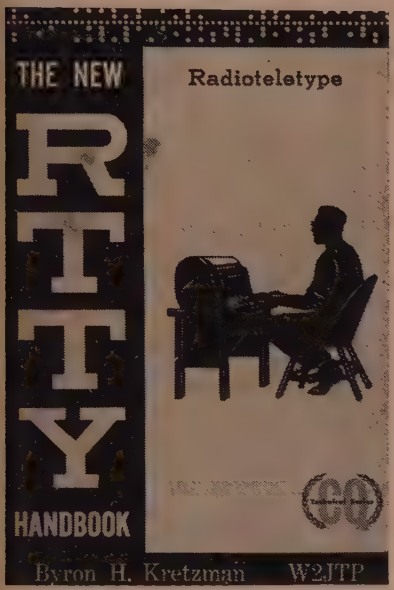

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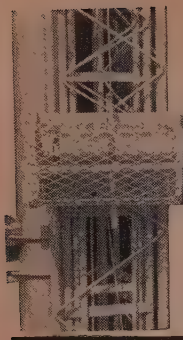

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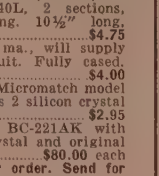

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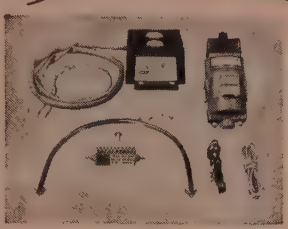

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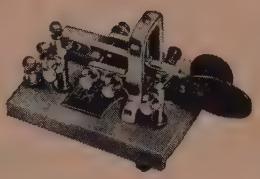

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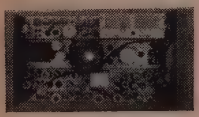

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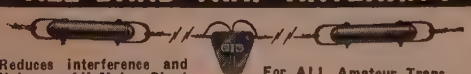

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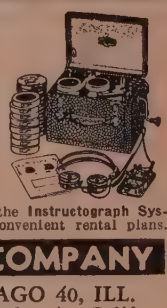

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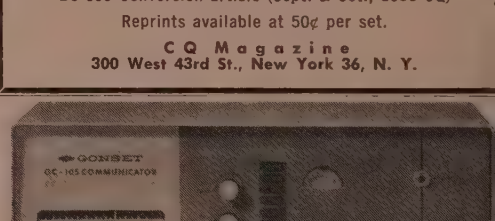

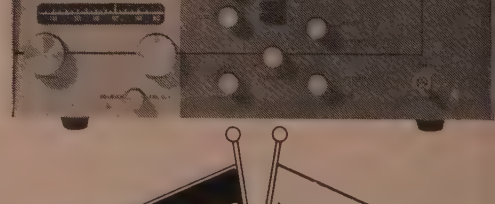

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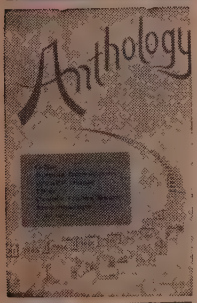

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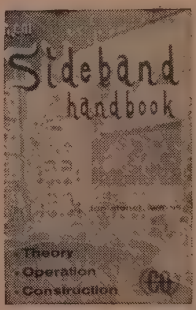

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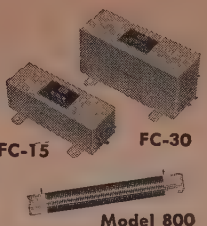

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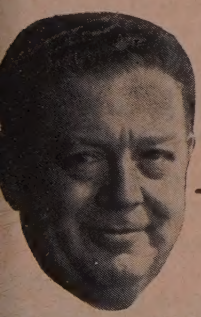

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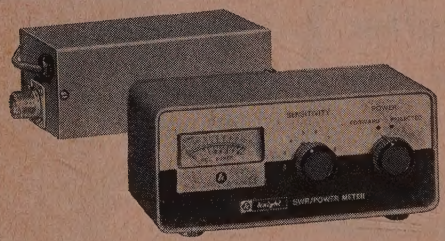

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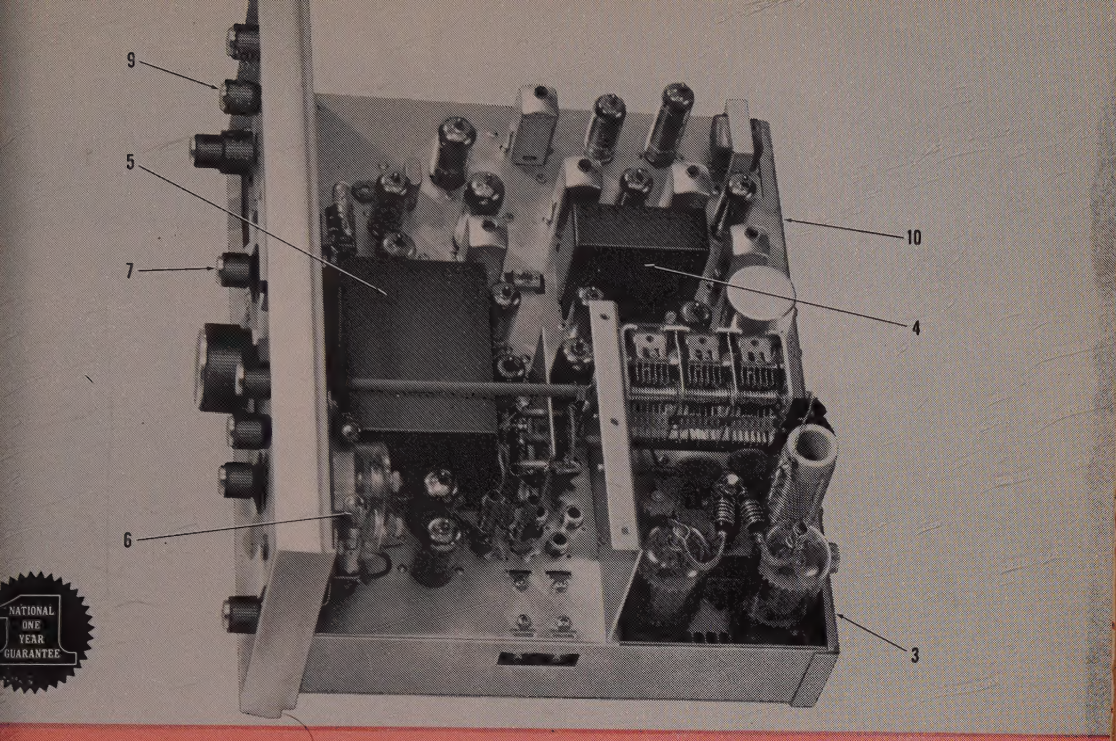

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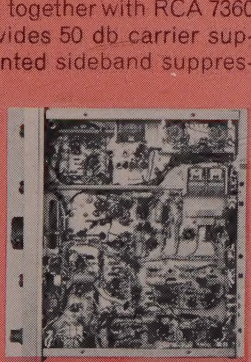

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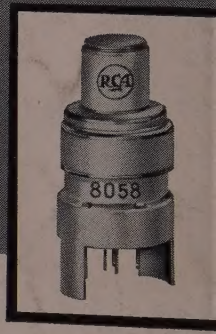

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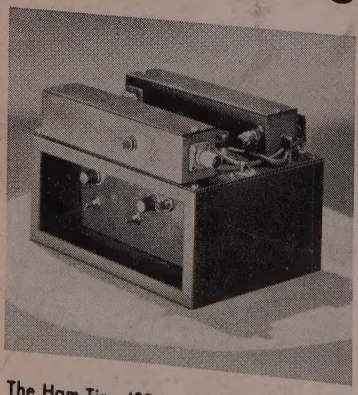

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